

AN
ARITHMETICAL
VVARLIKE TREATISE
NAMED
STRATIOTICOS

Compendiously teaching the *Science of Numbers* as well in *Fractions* as *Integers*, and so much of the *Rules* and *Equations Algebraicall*, and *Art of Numbers Cossicall*, as are requisite for the profession of a *Souldier*. Together with the *Moderne Militare Discipline*, *Offices*, *Lawes* and orders in euery well gouerned *Campe* and *Armie* inuio-
lably to be obserued.

First published by Thomas Digges Esquire Anno Salutis 1579. and dedicated vnto the right Honorable Earle of Leicester, lately reuiewed and corrected by the author himselfe, and also augmented with sundry additions.

Aswell concerning the *Science or Art of great Artillerie*, as the *Offices* of the *Sergeant Major Generall*, the *Mustier Maister Generall*, the *Coronell Generall*, and *Lord Marshall*, with a conference of the *Englishe*, *French*, and *Spanishe Disciplines*, besides sundrie other *Militare Discourses* of no small importance.



AT LONDON,
Imprinted by Richard Field.

1590.



TO THE RIGHT HONORABLE
my singular good Lord, the Lord Robert
Dudley, Earle of *Leicester*, *Baron* of *Denbigh*, Knight
of the most noble order of the Garter, and one
of her *Maiesties* most honorable priuate
Counsaile.



Ight honorable, finding my selfe
to your Lordship deeply bound,
as well for my preferment to her
Maiesties seruice, as for sundrie o-
ther fauours continually powred
on me, I haue carefully bethought
my selfe, which way I might ren-
der some testimonie of a gratefull
minde. And hauing spent many of
my yeares in reducing the Sciences *Mathematicall* from
Demonstratiue Contemplatiōs, to *Experimental aēlions*, for the
seruice of my Prince and Countrey: (being thereto greatly
aided by the *Practises*, *Observations*, *Monuments*, and *Con-
ferences* of my Father, with the rarest Souldiers of his time)
haue among sundrie other discourses of *Nauigation*, of *For-
tification*, of *Pyrotechme*, and great *Artillerie*, long sithence
commenced, lately finished this *Arithmeticall Treatise*,
wholy applied to *Militare* affaires. And finding not onely
by the whole course of *Histories* of all times and countreys,
how *Kingdomes* haue flourished in all Felicitie, wheras this
Art hath bene embraced, and duly practized, and contra-
riwise, how most happie *Empires* after warlike *Discipline*
hath bene corrupted, haue fallen to ruine, and miserable
seruitude: but also by experience euen in these dayes scene,
what extreame disorders growe in those Armies, where
Militare Lawes and *Ordinances* haue bene neglected: haue
thought this matter not vnfit to be remembered in these

The Epistle Dedicatorie.

our flourishing and quiet times, that as the *Pallace* of this most happie *Kingdome*, (ruled by a *Soueraigne Princeesse*, whose wisdom and rare vertues all *Europe* haue in admiration) is inwardly most curiously garnished with the perfection of *Sciences* humane and Diuine, with sundry *Artes*, with Riches, Rest, Wealth, and Pleasure comparable with, or surpassing anie other of Christendome: so wishing also it may not want (when neede shall be) the *Roofe*, and outward covering to defend and gard it from the winde and raine, and furious stormes of Forraigne *Tempestes*. And as the Fame of an honorable enterprise, vnder your Lordships conduite generally expected, did first moue me to employ my *Mathematicall Muscs* vpon this *Militare Argument*, so sithence hauing in some points altered, and augmented the first *Originall*, to your Lordship then presented, and now fully digested and finished the same, well knowing the *Method* such, as hitherto in no language hath bene published, and your Lordship for Wisdom, Learning, and *Experience*, (hauing long sithence borne honourable Office in the Field) fully able of your selfe to discerne the *Veritie* and *Valour* of this worke.) In discharge of some part of my dutie, I presume to present, and publish the same vnder the *Protection* of your Name. As a *Patrone*, I aduow my selfe to honor, by all other due dutifull meanes I can. And crauing fauourable acceptation of this my homely dutifull present, humbly leaue your Lordship to the direction of the *Almightie*, who graunt you a long prosperous life, garnished with continuall increase of honorable actions, to the amplifying of his Glorie and true *Religion*, the faithfull seruice of her most excellent *Majestie*, and comfort of vs all that loue and honor you.

Your Honors dutifully so commaund.

THOMAS DIGGERS.

THE PREFACE TO THE READER.



Having spent my yongest yeres
euen from my cradle in the Sci-
ences Liberall, and especially in
searching the most difficult and
curious Demonstrations Ma-
thematicall, by pꝛoofe at last I
found the saying of that wise
Tarentine & eloquent Romane
most true: That if it were pos-
sible for a mortall man by po-

wer Diuine to be transferred into some solitarie Garden
of incomparable pleasure, and there all things that could
be wished as it were by the hands of Angels to be mini-
stred vnto him, enioying perfect Health, Strength, and all
other good giftes of Nature, that were requisite to a full
perfection of delite both in minde and body, saue only that
it should not be lawfull for him to haue societie or confe-
rence with any man to communicate the state of his Feli-
citie: That notwithstanding all these delites, his life should
seeme tedious, and all those pleasures lothsome.

Euen so, albeit the strange varietie of Inuentions in the
moze subtile part of those Mathematicall Demonstrations
did bræde in me for a time a singular delectation, yet fin-
ding none, or verie few, with whom to conferre and com-
municate those my delites, (and remembꝛing also that
graue sentence of Diuine Plato, that we are not boꝛne for
our selues, but also for our Parents, Countrie, & Friends)
After I grew to yeares of riper indgement, I haue wholly
bent my selfe to reduce those Imaginatiue contemplations,
to sensible Practicall Conclusions: as well thereby to haue
some companions of those my delectable studies, as also to

To the Reader.

be able, when time is, to employ them to the service of my Prince and Countie.

First therefore, by Demonstrations Mathematicall finding the great imperfections in the Arte of Nauigation, & grosse Errours practised by the masters and Mariners of this our age, I sought by reason to perswade with some of them to alter and refoyme their Charts, Instruments, & erroneous Rules. shewing them infallible Demonstrations of their Errours.

In like sort, perusing the Auncient Romane Discipline for the Warres, their exquisite order of Trayning the Soldiorie euen from their infancie: in sundry sortes of hardnesse, Labour & Actiuitie: Their inuincible order in Marching Fighting, and Encamping, together with their diuine Lawes to keepe their Armies in obedience. finding also by conferring the Romane Histories, how afterwards by the dissolute disorder of Emperours this Discipline was corrupted, the Romane People disarmed, a Pretorian Garde maintained, which licentiouslly liuing, murdered and deposed the Emperours themselves, and sold the Empire for money to whom they list: And so by little and little the Maiestie of that Monarchie defaced, and the Romane People, which before gaue Lawes to the world, afterward most seruilely to abide, not onely all kinde of iniurie and villanie among themselves, but also inuaded, spoiled, sacked & conquered by the Hunnes, Vandales, Gothes, and other barbarous Nations.

The whole course of these Histories conferred with the rising and falling also of the Assirian, Persian and Macedonian Monarchies, did plainly demonstrate vnto me, that the well and euill vsing of this Militarie Discipline among all naturall causes was the greatest, or rather the onely occasion, of the aduancing, establishing, or razing and defacing of all Monarchies, Empires, Kingdomes, & Common Weales. And haue therefore with sun-
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Our Captaines conferred, and earnestly perswaded, that as in all other Artes and Sciences we aide our selues with Precedents from Antiquitie, so in this Arte of Discipline Militarie, so corrupted, or rather utterly extinguished, we should repaire to those Fountaines of perfection, and accommodate them to the seruice of our Time.

But as among many with whom I haue conferred, aswell of mine owne Countriemen, as Straungers, albeit I found some one or other of the better learned and best experienced, that ioyned with me in opinion, yet generally (such is the imperfection of mans nature) if they had bene in a few skirmishes, or taken any degrée in field, they thought it so great a disgrace, that any thing should be desired in a Souldiour that wanted in themselves, that presently they would giue their Definitive Sentence, that the Time was chaunged, the Warres were altered, and the furie of Ordinaunce such, as all those Romane Orders were more toys once to be talked of in these our dayes: As though the Heauens and Elementes had chaunged their Natures, or Men and Weapons so altered, as no humaine reason might attaine to consider the difference. Or as though the Romane Orders for the field (a verie few excepted) were not more conuenient, more seruiciable, and more Inuincible, (all alterations considered) euen in these our dayes, than they were for that age wherein they were vsed and practised.

In like sort by Masters, Pilotes, and Mariners, I haue bene answered, that my Demonstrations were pretie deuises: but if I had bene in any Sea seruices, I should finde all these my Inuentions more toys, and their Rules onely practisable: Adding further, that whatsoever I could in Paper by Demonstrations perswade, by Experience on Seas they found their Charts and Instrumēt true and infallible.

These constant asseuerations from men of that Pro-

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cession, even in their owne Art, did make me halfe distrust my Demonstrations, and to thinke that Reason had abused me, or that there were some such Misterie in Sea service, as no land mans reason might attaine vnto.

To resolute my selfe of this Paradoxe, I spent a fitene weekes in continuall Sea services vpon the Ocean, where by proofe I found, & those verie Masters them selues could not but confesse, that Experience did no lesse plainly discover the Errours of their Rules, than my Demonstrations. Sithens which time, I haue learned no more to be abused with the Opinions of men, what Office, or Degree soeuer they haue borne, or what Fame soeuer go of them, if Reason be repugnant to their Opinions. For

Magni sapè Viri, mendacia magna loquuntur:

Ratio dux fida Sophorum.

And Reason teacheth me, how barbarous that common opinion is, that an English man will be trained in a few weekes to be a perfect Souldiar. For if a Mason, a Painter, or other Mechanicall Artificer be scarcely able in seven yeares to learne the perfection of his Science, shall we thinke the Art of a Souldiar so base and abiect, that it is to be attained in a few weekes or moneths? But such is the vanity of the common sort, that if they haue caried Armes, and bene in a few services, they presently thinke themselves worthy the name of perfect Souldiars.

Yet Guillaume de Bellay, Seigneur de Langeay, a famous Generall of our age, hauing set downe a great number of parts requisite in a trained Souldiar, and also in a trained Band, concludeth with this resolution: That such a Souldiar or Band, as is able Encamping, Marching, and Fighting, to execute all those his prescribed orders, albeit he neuer saw the Enemy in the face, yet I holde him (saith that Generall) an old Souldiar, or a trained Band. And otherwise, if he haue bin neuer so long in the warres, yea if it were possible for him to be in a thousand services,

if

To the Reader.

if he be not able to perfoꝛme those Orders, I account of him but as of a raw vnttrained Souldiar.

But seeing it would require at the least an whole age, and the direction of some rare Prince to reduce Souldiarie to the antique perfection, and therefore in vaine for any priuate man to intermeddle therewithall: yet somewhat to discouer that grosse Errour, that Souldiarie may so sone be learned, and that we may haue some tast and feeling at least of our owne ignozance and imperfection, and to awake our Nation out of that secure Dreame, hauing partly by experience my selfe seene, what extreame disorders growe, and dishonors are receaued for want of Militare Discipline: I haue therfore thought good, according to the best obseruations of our Moderne Warres, and Seruice of this Time, to set downe the Office and dutie of each person and calling, passing from a Priuate Souldiar to a General, with certaine Militare Lawes to be obserued in euery wel gouerned Armie.

And albeit I well knowe, these matters Militare, (not being Mathematicall, and therefore not to be confirmed by inuincible Demonstration, but as Philosophie, Law, Phisicke, and such other Arts, standing on probabilitie onely) may and will in many opinions be impugned, yet hauing discourse of Reason, with Authoritie, and Example, not onely from Antiquitie, but also of the most notable and famous Souldiars of our Age in Christendome, as well in their priuate as publike Actions, to confirme and ratifie these orders and Discipline by me deliuered, I am in the better hope, the wise, and best experienced, will not mislike my Trauels, tending chiefly to this ende, that our Nation in this happy peace may not rest altogether careles of Warres, but in such sort prepare their Minds and Bodies that when need shal be, they may be found the more ready, and capable of orders Militare, which do so well confoꝛme with Ciuil and peaceable gouernement, as nothing more.

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Notwithstanding, the corruption of Militaire Discipline, and licentious living of the Souldiour of our time, hath made them odious, who of all other should most be embraced and loved, if these Errors were reformed, and this their Art duly practised.

For who ought to be a greater lover of Peace than he? who chiefly in Warres is to endure Paine, Perill, Hunger, Cold, and infinite other diseases.

Who ought to be more faithfull to his Prince, and Countrey, than he? whose Oth and profession is to Sacrifice himselfe for the same.

In whom ought there to be a greater love and feare of God than in him: that euerie day committing himselfe to a thousand dangers and hazards of life, hath most neede of his aid and helpe.

These things considered of the Founders of the most honorable Kingdomes and Monarchies of the World, did cause them by all meanes to embrace this Art, and together with Artes Ciuill, to traine their Subiects in this Science Militaire, as hereafter more particularly I shall haue cause to declare, hauing in this discourse no farther relyed vpon the Discipline of the Antiquitie, than by Reason, Example, and Authoritie of the most famous Generals and Souldiers of this Age in Christendome. I haue found necessarie to dissent from such brute customes as the Barbarous Gothes. &c. left vs, and our delicious ydle ignorance hath still nourished among vs, embracing all such Moderne Ordinances and vsances, as are not quite repugnant to all good Discipline, and by no meanes to be allowed or tollerated.

The whole Treatise I haue deuised into three Bookes.

The first compendiously declareth the five vulgar Arithmeticall kinds, with the extraction of the Rootes Quadrate, and Cubicall, in whole numbers, and also in Fractions. This was begun, and almost finished by my Father.

In

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In the second Booke I haue taught the same kinds in numbers Cosicall, with so much of the Art of Algebra, as I finde necessarie for a Souldiar, and thereto adioyned sundrie Questions in diuers of the principall Offices of the Field.

And because such Noblemen or Gentlemen as will apply themselves to that honorable profession, may know how in many other Seruices Militare Arithmetike may stand them in steede, I haue added the third booke of Militare Lawes, Offices, and Duties.

Last of all I haue set downe certaine Questions touching great Ordinance, to be considered, and resolved of such as haue the perfection of the Arte of maneging great Artillerie, giuing also vnto such as are or will be practizers therein, some light, how to direct the order of their Practises. And if they be found of that difficultie that none will undertake to meddle with their resolution (as I see these my Laboures gratefully accepted) I will impart with my COUNTRYMEN my Treatise of Great Artillerie and Pyrotechnie, delinering the same with sundrie rare seruiceable secretes, hitherto not put in execution by any Christian Prince.

Otherwise, by the example of my Father, Pythagorically I will content my selfe Per manus tradere, and to communicate them onely with a few select friends.

And so good Reader I commit thee to the Treatise it selfe, wherein if thou finde any thing that doth content thee, yeld due thanks to the Patrone of the Worke, whose honorable disposition in fauouring & aduancing all Vertue, & chiefly the studious of these Liberall Sciences, with many especiall fauours vpon my selfe, hath prouoked, or rather inforced me, to take in hand this present Worke, finished the 13. of October. 1579.

The Contentes of this Treatise briefly ensue.

The first Booke Arithmetically.

<i>Numeration.</i> Chap. 1 <i>Addition.</i> Chap. 2 <i>Subtraction.</i> Chap. 3 <i>Multiplication.</i> Chap. 4 <i>Division.</i> Chap. 5 <i>Reduction.</i> Chap. 6 <i>Progression.</i> Chap. 7 <i>Quadrat Radix.</i> Cha. 8. <i>Radix Cubicall.</i> Chap. 9 <i>Proofs of the Pre.</i> (a. 10)	Of Inte- gers Ab- tract.	<i>Nomination.</i> Chap. 11 <i>Reduction.</i> Chap. 12 <i>Abreniation.</i> Chap. 13 <i>Addition.</i> Chap. 14 <i>Subduction.</i> Chap. 15 <i>Multiplicatiō.</i> Cha. 16 <i>Partition.</i> Chap. 17 <i>Roote Square.</i> Cha. 18 <i>Root Cubical.</i> Cha. 19 <i>Rules of Proportiō.</i> C. 20	Of Fra- ctions. Direct. Inuerfed. Doubled.
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The second booke Algebraicall.

{ <i>Explication of numbers.</i> { <i>Cosicall in new Characters.</i> } Chap. 1. { <i>Addition.</i> Chap. 2 { <i>Subduction.</i> Chap. 3 { <i>Multiplication.</i> Chap. 4 { <i>Partition.</i> Chap. 5 } { <i>Of Fractions Cosicall.</i> } Chap. 6. { <i>Integers.</i> } { <i>Fractions.</i> } Denominate. Chap. 7. { <i>Equations.</i> } { <i>The Rule of Cossé.</i> } Chap. 8. { <i>Inuention of Quadrates or</i> { <i>second Rootes in 5. Rules.</i> } Chap. 9.	Of Integers denominate or Cosicall.
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Questions

{ Questions touching the Office of the Sergeant
Maior. Chap. 10.

{ Questions of the High Marshall his Office:
or Campe Master. Chap. 11.

{ Questions concerning the Office of the Ma-
ster of the Ordinance. Chap. 12.

{ Questions concerning the Treasurer, the
Master of the Victuals, and Captaine of
the Pioners. Chap. 13.

Arithmeti-
cally re-
solved.

The third Militare, containing Offices, Lawes, Strata-
gems, Battaile, Campe, &c.

A Private Souldier.

A Corporall.

A Drummer.

A Surgeon.

A Clarke of a Band.

The duty of

A Sergeant.

An Ensigne.

A Lieutenant.

A Captaine.

A Colonell, with speciall instructions for train-
ing of Souldiers.

Cariage Master.

Master of the Victuals.

Trench Master.

Quarter Master.

Scoute Master.

Sergeant generall.

The Office
of the

Mustermaster generall.

Treasurer and Auditor.

Master of the Ordinance.

Lieutenant generall of the Horse.

Colonell generall of the Foote.

Lord Marshal, with the { English } Disciplines
{ Spanish } Martiall.
Lord Generall. { French }

C

The Portraict of a Battell and Campe.

Questions of great Ordinance, with some Resolutions and new Additions concerning that Art.

An other Discourse concerning the best meanes to repulse invasion, long since exhibited to the Patron of this Stratioticos, and now adioyned to the Treatise it selfe, with diuerse other important matters Militare.

**The Bookes already published by the
Author of this Treatise.**

A Generall Pronostication long sithence published by his Father, after perused by himselfe, and thereto adioyned the frame of the World, according to *Copernicus Hypothesis*, vpon the mobilitie of the earth.

A Geometricall Treatise called Pantometria, begun by his Father, augmented and finished by himselfe.

A Booke in Latine entituled Alas, seu Scale Mathematica, deliuering sundrie Demonstrations, for the finding of the *Parallaxis* of any Comet, or other Cœlestiall bodie, with the correction of the Errors in the vse of *Radius Astronomicus*.

This present Arithmeticall *STRATIOTICOS*, diuided into three Bookes.



1

The kindes of Algorisme, which I intend
 briefly to treat of, as well in broken as whole,
 are these, *Numeration, Addition, Subtraction,*
Multiplication, Partition, Reduction,
Progression, with the finding
of the Rootes, Square,
and Cubicall.

The first Booke.

Of Numeration. Chap. i.



Number is the multitude of Unites set to-
 gether, as 2. 3. 4. &c. All Numbers may
 be expressed by these Characters follow-
 ing.

1 2 3 4 5 6 7 8 9 0

Whose simple value by themselves con-
 sidered, you may heere-vnder behold.

i ii iii v vi vii viii ix 0

The Ciphra 0 augmenteth places, but of himselfe signi-
 fieth not. To number any summe nothing else it is, but to
 declare the value of euerie Figure placed. So many pla-
 ces are in your worke, as there be Elements from the
 right hand to the left. Euerie Figure in the first place be-
 tokeneth himselfe, and so toward the left side, tenne times
 so much as he was the place befoze.

Example.

The value of the figures placed.

00

000000

C X 0 C X 0 C X one

The last 1 1 1 1 1 1 1 1 The first place

C ii

To auoid confusion, and to attaine quicke and readie numbring. In great numbers handle your summe thus. The fourth place which representeth a \mathcal{M} . let him haue a prick over the head, the fiste and sixt omitted, the seauenth mark, the eight & ninth ouerpasse, the tenth note. Likewise the eleventh & twelfth not regarded, point the thirteenth, & so forth two places neglected titling the next. Example.

21097462532413

Go to the last place noted 02 pricked, which is on the left hand, reckning all \mathcal{Y} Characters afoze that point leftward, with the figure vnder him, together, euen as their places from that title do appoint, passing forth not staying to all the points, giuing to that & to euerie of them this tearme Thousand, returning againe to the next figure significative ensuing the prick. Now toward the right side still renuing your course againe by the points, not forgetting this terme thousand so oft to be named as you haue points to come vntil euerie figure is valued. Behold the counting of the summe immediately before written. 21 $\mathcal{M}\mathcal{M}\mathcal{M}\mathcal{M}$. Because there be foure pricks, I giue this terme thousand four times, represented by this letter \mathcal{M} . Now returne againe to \mathcal{Y} next figure of signification, following the prick saying 97 $\mathcal{M}\mathcal{M}\mathcal{M}$. 462. $\mathcal{M}\mathcal{M}$. 532 \mathcal{M} 413. Thus do of all such like. Here neede no mo words for so plaine a matter.

There be three sorts of nũbers, the one a Digit, \mathcal{Y} other an Article, the last a mixt or a compound. Al nũbers not exceeding 9 vnites, are called Digits, as 123456789. Articles be nũbers of tens, or those \mathcal{Y} may be deuided into 10 equal parts, as, 10, 20, 30, 40, 340, &c. The cõpound is a nũber of both, as 12, 13, 14, 24, &c. Of Numeratiõ this here sufficeth.

Of Addition. Chap. 2.

To adde is to gather and knit in one many numbers or vnites, whereby the whole sum manifestly may appeare, as 3, 15 and 22 maketh 40 the whole &c.

Be,

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Begin your collection from the right hand to the left, from the lowest number to the highest of that row, & what Digit resulteth, subscribe. Set your numbers in due place, yea directly the one vnder the other, with a line drawn beneath them, as in the Example. And note so many articles as surmounteth in any order, ought to be adioyned to the next rowe or row leftward, calling them by the name of Unités, conueying the Digits or Ciphre euer vnder the line. Now gather these summes in one which follow 9554. 4030.9923. Place them rightly the first vnder the first, and so correspondently, as by example here appeareth.

$$\begin{array}{r}
 9 \ 5 \ 5 \ 4 \\
 4 \ 0 \ 3 \ 0 \\
 \hline
 9 \ 9 \ 2 \ 3 \\
 \hline
 2 \ 3 \ 5 \ 0 \ 7
 \end{array}$$

Now adde 3 and 4 which make 7, omitting the 0 signifying nothing: write 7 vnder the line in place due, the 2, 3, and 5 is 10, put the Ciphre 0 vnder, keeping the article in minde. Now 9, 0, 5, and one in memorie, yeldeth 15. Put the Digit 5 beneath the line, not forgetting the article at the next order, 9, 4, 9, maketh 22, and 1 in minde 23, put 3 downe, and the two articles reposed in memorie a place further. Behold vnder the line your tofall summe, with your figures right placed. The whole Additiō is 23507. Now money of diuers kinds is added, you shall perceiue when you come to the Addition of Numbers Cossicall.

Of Subduction. Chap. 3.

TO subduce or subtray any summe, is wittily to pull a lesse from a bigger number, or an equall from a like or equal, so that the remaine if it be any thing, do appeare. As if I take 35 frō 40, there is left 5. In this kinde you shall worke as afoze from the right side to the left, deducting the lower from the higher summe in that order subscribing the remnant. Also euery Element must haue his conueniēt place, as is said of Addition, the one direct vnder the other.

C ij

When

the upper is the lesse nūber, or a Ciphze, then shall you consider the distance of the lower number frō this article 10, & adioyne the same distance vnto y^e said lesser nūber, subscribing it, giuing alwayes one vnite to the next Element.

Example.

From 1304053 I would haue 400271 subtracted, put them in right order, as ensueth.

$$\begin{array}{r}
 1 \ 3 \ 0 \ 4 \ 0 \ 5 \ 3 \\
 4 \ 0 \ 0 \ 2 \ 7 \ 1 \\
 \hline
 9 \ 0 \ 3 \ 7 \ 8 \ 2
 \end{array}$$

One from 3 remaineth 2 vnder y^e line with him in place nexte, 7 from 5 it may not, the distance of 7 from 10 is 3, wherefore I doe accompanie 3 with 5 and it maketh 8, put that 8 vnder, now 2 and 1 in memorie reposed, noteth 3, from the Ciphze 0 it may not be, the distance of him from 10 is 7, which put to the Ciphze maketh but 7. Let him haue his place in like maner vnder. This Ciphze 0 ensuing, and 1 in mind, encreaseth but 1. Take that from 4, remaineth 3, to be set vnder the line. Againe, the Ciphze 0 from this circle 0 subtracted, nothing is left. This 0 must haue place vnder. Then 4 from 3 it may not. The distance of 4 from 10 is 6, which ioyned with 3, maketh 9 to be placed beneath the line, now one in memory taken from 1, remaineth 0, wherefore this Ciphze 0 should be put vnder, vnlesse it chance as it doth here in the last place. The summe remaining of this Subtraction, is 903782, as appeareth vnder the line in the Example.

Of Multiplication. Chap. 4.

To multiplie, is to finde of two Numbers a nūber product the one in the other augmented, the which so often may conteine the nūber multiplied, as there be of Unites in the Multipliator. The lesse is named the Multipliator, or Multiplier: the other y^e summe or number to be multiplied. In this kinde, you shall labour frō the right side ec.

The

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5

The Elements there disposed in iust order, and wrought as the Examples following declare, I would multiplie 3020 by 3, dispose your numbers thus.

The number so
be multiplied. } 3020

The digit that
doth multiplie. 3

The Product. 9060.

Now say 3 times 0 encreaseeth nothing, conuey this 0 vnder the line, 3 times 2 causeth 6, subscribe 6, thise 0 maketh nothing. write the Ciphre beneath the line. Thise 3 produceth 9, put him vnder. Behold your summe beneath the line 9060. Because the multiplication of Digits is first necessarie to be knowen befoze any other Example be written, I haue prepared for their augmētation a Table, not a little conducing to Partition, as to the practiser after shall appeare, the vse is this, you shall seeke the Digit to be multiplied in the one side of the Table most commodious, the Multiplier in the other, at the common meeting of both, the Product sheweth himselfe.

Pythagoras Table.

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30
4	8	12	16	20	24	28	32	36	40
5	10	15	20	25	30	35	40	45	50
6	12	18	24	30	36	42	48	54	60
7	14	21	28	35	42	49	56	63	70
8	16	24	32	40	48	56	64	72	80
9	18	27	36	45	54	63	72	81	90
10	20	30	40	50	60	70	80	90	100

This Table of the Pythagorīas was taught vnto chil-

dozen, together with their first letters, being in due order as necessary to be conned by rote, and had in perfect memorie for the perfection of Arithmetike, as the common letters, or spelling of Syllables are to the Grammatica. This Table therefore first printe lively in thy remembrance, and then boldly proceede further, all difficultie I assure thee is past.

An other Example: I would multiplie 734 by 92.

<i>The number multiplied.</i>	734
<i>The Multiplier,</i>	92
	<hr/>
	1468
	6606
	<hr/>
<i>The Product.</i>	67528

Your figures on this wise placed, & a line vnder them drawn, with the first figure of your Multiplier which is 2, begin thus, saying two times 4 encreaseth 8, put him vnder the line, euē with 4, y first of your nūber to be multiplied. Then twice 3 maketh 6, conuey him vnder the line iust with 3, which is the second Character of your number to be multiplied. Two times 7 is 14, place the Digit 4 vnder 7 the third of your multiplied number, and the article 1 a roome farther, now dash 2 with your penne, his office performed, being the first figure of your Multiplier. Then to the other Character, the second, which is 9, saying, nine times 4 is 36, put the Digit 6 vnder 9 your second Multiplier, the article 3 kept in minde, the nine times 3 is 27, and 3 reposed, yeldeth 30. put this 0 vnder 4, and 3 in memorie for y next place: nine times 7 is 63 & 3 in minde causeth 66, set 6 vnder 1, & the six articles a place farther leftward, so by Addition you haue (as it is aboue vnder line written) this summe 67528, the whole Multiplication.

Compendious formes of Multiplication.

If you will multiply by this article 10 100 1000 10000 &c.
to the nūber which must be multiplied by these articles,
adde

adde so many Ciphers as goeth befoze the Unite.

Example 36 by 10, put the Ciphre 0, and it is 360. Multiplie 45 by 100, adding the two Ciphres, is made 4500, & so of the rest. If by chance one Ciphre or many come in the beginning of the number that multiplieth, or the number to be multiplied, or both, put away al these Ciphres, reseruing them to the end, multiplying the rest of the figures, & then adde all the Ciphres to the beginning or first place of the Product of that Multiplication. As 3200, by 2000, augment 32 by 2, and put vnto the Product, which is 64, those six Ciphres, so is it 64000000. And whē Ciphres by chance come within the nūbers, you may ouerleape those of the Multiplier. Also if you list to multiplie by 5, you may mediat: or diuide your summe by 2 adding to y^e Product this Ciphre 0, which must occupie y^e first place. Being odde, let 5 take the first rōme, after the Mediation, not regarding the Unite left of the number to be diuided.

A rule whereby also the demonstration
of Multiplication may be gathered.

When you haue numbers to be multiplied, diuide which sum you list into what portions you wil, the that number not parted multiply in euery of those parts: y^e summes collected declare y^e same which the two whole nūbers multiplied together would haue brought. Example.

I would multiplie 342041 by 1110, diuide this sum 1110 in parts as 1000, 100, 10, & with euery of them multiply the other 342041 the nūbers produced are these.

342041000

34204100

3420410

makeh 379665510.

Now collected.

This is demonstrated in the first Proposition.
of the second booke of *Euclides* Elements.

D

STRATIOTICOS.

Of Partition. Chap. 5,

To diuide or part, is ingeniously to find how oftentimes the diuisor is cōteined in the number to be diuided, or to part any nūber into as many portions as your diuisor appointeth. Then diuision sheweth onely how often the lesse summe is cōteined in the bigger, as if I would diuide 40, by 8, it declareth how oftentimes 8 is cōteined in 40, so find I 5, & thus is my diuisiō perfozmed. The lesse summe is the Diuisor or Diuidēt, & other the nūber to be diuided or diuisible, vnder whō, the two lines or parallels must be drawen for your quotiēt, & the Diuisor vnder them. This kinde being cōtrary to Multiplication, requireth contrary working, that is, from the left, to the right hand: your Diuisor there found, how often he is cōteined in the nūber ouer him, that same Character placed in the quotient, and the Diuidēt or diuisor in that Character found multiplied, Subtraction made, &c. your Diuisor ought to be remoued to the next place toward the right hand, and so to the end, as by example moze plainly shall appeare. I would diuide 3089 by 3. at all times set and order your number thus.

	0 22
<i>The number to be diuided.</i>	3089
<i>The Quotient.</i>	1029
<i>The Diuisor.</i>	3333
	6

Paralels now drawen, and my Diuisor placed vnder the last of my number to be diuided, which was 9, I finde once 3 to be 3, which Subtracted from the figure 9 right aboue him, nothing is left, dash 3. This one place betwēne the lines right ouer 3. The Diuisor 3 conuey to the next roome rightward, where in the Ciphze ouer him, he is not once found, therfoze put this Ciphze 0 betwēne the Paralels, right ouer the Diuisor, & so remouing a place further
tha

that vnder 8, there you finde the diuident twice: wherefore, put 2 in the quotient right vnder 8, then say twice 3 is six, which subtracted from 8, leaueth 2 ouer 8 dashed. The Diuisor 3 now dashed, is conueyed to the next and last place, which being found 9 times in 29, put 9 in the quotient, saying, 9 times 3 maketh 27, that subtracted from 29 aboue, 2 remaineth ouer 9, the rest dashed. Note, if it chance that the Diuisor be contained oftner than 9 times, onely 9 put in the quotient. Behold another example 19031 to be diuided in 211 partes, place them directly thus.

$$\begin{array}{r}
 \text{The number diuisible. } 19031 \\
 \text{The Quotient. } 9 \quad 0 \quad 4 \quad 1 \text{ Remaines.} \\
 \text{The Diuisor. } 211 \text{ Diuisor permanent.} \\
 \begin{array}{r}
 99 \\
 21
 \end{array}
 \end{array}$$

Parallels drawen, and all things placed as the example sheweth, because 2, the last of the Diuisor, is bigger than 1 the last of the number to be diuided, he hath place vnder the next, which is 9, 2 is contained in 19 nine times, therefore put 9 in the quotient, placed as you see vnder 9, saying 9 times 2 is 18, take that out of 19, there remaineth 1 to be set ouer 9, dashing 2 & 19 with your penne. Then 9 times one is 9, strike one, take that out of 10, ouer remaineth 1 ouer the Ciphre, the vnite leftward put out. Now to the last of your Diuisor, 9 times 1 is 9, dash 1, take that 9 out of 13, aboue remaineth 4 ouer 3, strike 13 with your pen, remoue your Diuident a place further rightward, the rest following leftward in order. See how oftentimes your Diuisor may be had out of the number ouer him, that is no time, put therefore the 0 in your quotient, dashing every Element of your Diuidet, permitting the remaines to be set ouer the Diuisor, and so you haue in your quotient 90, there remaines 41. In like maner, all other numbers are diuided.

Use in this matter preuaileth, and openeth that which many wordes cannot.

Diuision being but a conuerse working, or resolution of Multiplication, is demonstrated by the foredged first Proposition of the second booke of the Geometricall Elements.

Speedie and compendious

fashions of *Diuision*.

Looke how many Ciphres the Diuisor hath afore the figures of signification, so many places separate by line, or cut away at the beginning of your number that shall be diuided, the rest shall suffer partition by the Characters onely signifiatiue, as is declared with mixt Ciphres in your Diuidend.

Example.

The number to be diuided, is 3454000: the Diuisor 30200: No two Ciphres vnmixt in your Diuisor, therefore two places in your number to be diuided must be cut away, then the rest stand thus to be diuided.

$$\begin{array}{r}
 \begin{array}{r}
 11 \\
 132 \\
 04322 \\
 \hline
 \end{array} \\
 \begin{array}{r}
 \text{Diuidend.} \quad 3454000 \\
 \text{Quotient.} \quad 114 \\
 \hline
 \text{Diuisor.} \quad 30222 \quad 30200 \text{ Diu. permanent.} \\
 \quad \quad 3008 \\
 \quad \quad 3
 \end{array}
 \end{array}$$

The remaines 112 shall be ioyned with the Elements cut away and put ouer the whole Diuisor as aboue. This as I thinke is sufficient for Diuision: more would rather discourage than further.

Of Reduction, Chap.6.

To Reduce, is to bring a number of grosse denominations into a smaller, or contrary, Grosse to subtile by Mul, tipli,

tiplication, Subtile, to grosse by partition is performed. A number of grosse Denomination is that, which containeth many other subtiler or smaller, as a pound in respect of Shillings. Shillings in comparison to pounds are a subtile denomination. If you will reduce any grosse sum in, to a subtiler, or cōtrarie, you must wel ponder how many of that smaller do make one of the grosser, & by that multiplie or diuide, as occasion is giuen. I would bring 600 £ into halfe pens. First you must reduce them into Shillings, multiplying by 20. Then augment the Product by 12, so be produced pens, and for halfe pens multiplie the summounting number by 2. The whole summe reduced, standeth thus 288000 halfe pens. Now by partition this subtile summe is brought to his former estate, that is, 600 £. In like manner, a mile in respect of furlongs, furlongs compared to scozes, scozes to pearches, pearches to yards, yards to fēte, fēte to ynches, ynches to Barlie coznes referred, be of grosse Denomination. But Barlie coznes to ynches, ynches in respect to fēte, and so vpward, haue a subtile Denomination.

Our English mile grounded vpon the Statute, hath ordained thre barly coznes drie and round to make an ynch, twelue ynches a fote, thre fote a yard, $5\frac{1}{2}$ yards a pearch, & forty pearches in length, and foure of breadth, an acre of land: so the acre containeth 160 pearches, the halfe 80, and the yard, which is the quarter 40. Twenty yards make a scoze, and forty pearches a furlong, 8 furlong a mile. So that by Reduction, you may find in the English mile 320 pearches, 1760 yards, 5280 fote, & 63360 ynches, somewhat greater than the Italian mile of 1000 pace, & 5 fote to a pace.

Of waight, according to the Statute of *England*.

The English Penny which is called the Sterling round without clipping, shall wey 22 graines of wheat drye and in the midd of the eare. 20 pens maketh 1 ounce, 12

ounces maketh a pound, and this weight is called *Troy weight*, which Goldsmithes commonly vse. By this which is said, you may gather the ounce to conteine 440 graines of weight, and the pound 5280. There is another moze vsuall waight called *Haberdepoys*. The Scruple containeth 20 Graines of Barlie, as the Pennie of *Troy*, the Dramme 3 scruples, the ounce 8 Drammes, so ye may perceiue 480 Graines of Barlie in the ounce, and 7680 in a pound: but these rates often alter.

Of Progression, or rather of most compendious Addition. Chap. 7.

Progression is a very compendious way to knit and gather in one those numbers which do procede with an even and equal distance. In all Arithmetical Progression, you shal conioyne the extremes, augmenting the number of those extremes so added, with the number that sheweth how many places there be in the whole round of your progression, the product mediating, as 5. 10. 20. 25. 30. 35. By adding the extremes which is 5, and 35 encreaseth 40, multiplie it by the places which is 7, riseth 280, divided by 2, or mediated, sheweth 140 the whole summe. There is another kinde of Progression, named Geometricall, which encreaseth by 2, 3, 4, 5, or mofold infinitely, behold y^e figure.

1	2	4	8	2
2	6	18	54	3
3	15	75	375	5

I call it *fuefold*, when the first number may be found iust 5 times in the next summe, and so of the rest. For these and all other like, multiplie the last number by that it folded, subtracting the first from the product, continually diuiding by one lesse, than the doubling or folding is. Example 1, 2, 4, 8, 16, 32, 64, this number foldeth by 2, therefore multiplie the last 64 by 2, which maketh 128, Subtract 1, the

the first figure, so remaineth 127, that diuided by one lesse than the folding againe 127, riseth the whole summe of your Progression. Note if you multiplie the last, or any other place of Geometricall Progression (beginning with an Unite) with himselfe, the product sheweth as many more places saue one. Example. I would haue the fourteenth place, or roome of the Progression immediately aboue written, 63 the last number of that proportion, declareth 7 roomes or places, and in himselfe multiplied, bringeth 4096 the thirteenth place, now multiplie by 2, with which it folded, so haue you 8192, the fourteenth roome your desire: for the true value of all, do as is aforesaid of Geometricall Progression.

The finding of Rootes of square numbers. Chap. 8.

TO finde the square *Radix*, or Roote of any number, is to gather a summe that multiplied in himselfe, if it be quadrate, iustly may make the aforesaid number, or else it may engender the bigge squares summe in that contayned. A square number is that which resulteth of any number once multiplied in himselfe. A quadrate *Radix* is called that number, which by himselfe multiplied, yeldeth a square summe. To quadrate or to augment squarely, is to encrease any number with himselfe, as foure times 4, maketh 16, it followeth 16 to be a square number, and 4 of that sum the roote or *Radix*: even so of all other. A square number deuised by vnites, maketh a quadrate Figure as appeareth.



Because the Quadrate roote differeth little from Diuision (for it is as it were a kind of Partition) it needeth not many words, you shall begin to worke as in that kinde, that is, from the left hand to the right, putting downe your numbers, separating euery two elements from the beginning with pendent or hanging lines, drawing also two Paralels vnder them for your quotient.

Examples.

I would haue the *Radix* of 3969: place and handle your numbers thus.

	0	3	00
The number proposed.	39	69	
The Roote Q.	6	3	
The double numbers of the Rootes.	36	29	
	x 6		
	3		

You shall search for a number, which multiplied in himselfe, may consume as nigh as may be 39, being the two first figures leftwards separated by line, which is 6, put him betwene the Paralels vnder 9. When say six times 6 is 36, take it out of 39, so remaineth 3, to be written ouer 9. This done, double your Quotient 6, which maketh 12. That doubled number ought to be set vnder the Paralels, the first 2 vnder 6, the next 1 vnder 9. Again, you ought to finde a number, which multiplied in the said double, shall wast the summe leftward, and directly aboue it in y head, you may find that number to be 3, which you must put in the Quotient vnder 9, the next place following the double. Note your Radicall Digits found, must be placed vnder the element next to the pendent lines. Then say, three times twelue maketh 36. After you haue taken 36 from 36 dashed in the head, you shall multiplie 3 the last found number of the Quotient in it selfe, and take it out of the numbers ouer. This done, y number is perceiued to be square becaus

because nothing remaineth. The Quadrate roote being 36. When it shall chance that you may not finde a sum, which multiplied in the double number, and after in himselfe may be taken out of the head, then you shall go forth, and set downe this Ciphre 0, doubling your quotient as afoze. Here foloweth another example, work it for your exercise.

		x		0	0
4	9	4	2	0	9
7		0			3
	x	4	0	0	9
		x	4		

Note this oftentimes, the number aboue the double is so great, that it troubleth beginners much to know what Digit will serue. Therefore diuide the number leftward, and aboue the double, with the double it selfe, the Quotient will declare verie nigh the Digit to be put betwæne the lines. If you require exactnesse, see whether the residue of that which is left of Diuision, with the Character of the Element, vnder whom the Digit must be put, be bigger or equall in number with the Digit himselfe multiplied: if it be the lesse, the Digit must be diminished one Unite or two at the most. Also note, the remaines shall haue his name of the *Radix* doubled, adding to it an vnite.

Another subtile way to find this *Radix*.

Take any number, whose Roote you require, adde rightward so many Ciphers as you list, so they be even, as 00,0000,02 000000. Of that which resulteth, seeke the quadrate Roote, as we haue afoze declared, not regarding the Remnant. Take from the *Radix* found so many elements as the number of halfe the Ciphers afoze added, the other toward the left hand keep for integers of your Roote: multiply the elements taken by what article number you list, even as you will haue the parts of the whole come, as by 10,30,60, &c. from the Product pull so many elements as

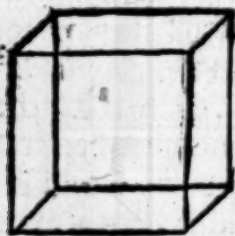
halfe the aforesaid added Ciphres, the rest that remaineth, write beside the integers of your roote, as a Fractiō, whose name (of the article) he must haue by whom he was multiplied, and thus procede, till you haue all Cyphres, yea so many, as halfe the afoze added. The more Ciphers you put at the beginning, the more preciser your roote shall be. Here needeth no example, if all things aboue written be vnderstood.

The finding of the Cubicall

roote or *Radix*.

To search or pull out the *Radix*, or roote Cubicall, is to get a summe multiplied once by himself, and againe in the Product engendring the number proponed if it be Cubicall. A number Cubicall is that which by multiplication in himselfe, and again in that surmounteth, is ingendred. *Radix* or Roote Cubical, is that number so multiplied, making the said summe cubicall. To multiplie any number cubically, is to encrease it once in himself, and againe that number with the product, as if I would multiplie 4, 4 in himselfe maketh 16, and foure times 16, is 64. A solidate cubicall figure, is imagined with sixe square *Superficies* or sides like a Dye, as this Figure sheweth.

Cubus.



The searching of the roote Cubicall, is not verie vnlike to the finding of the quadrate roote, this first excepted, that the Figures must bee put downe, euery third separated from

from the beginning with hanging lines : behold the Example.

	0	(2		7	6	
	2	2		9	8	(4
The number proposed.	4	9		4	2	8
Radix Cubicall.		3				6 2 7 6 4
The tripled Rootes.	2	7		4	9	6 3 9 9 7
	x	9		2	4	
					x	

All things well disposed as is said, now I must take a number multiplied in himselfe cubicall, which may take away as nigh as may be 49 : 4 is too much, 3 will serue. Put downe 3 in your Quotient vnder 9 next to y^e pendent line rightward, multiplying him cubically, the Product 27 subducting from 49, remaineth 22 ouer their heads. Then triple 3, setting the Product vnder the next element saue one, from the Digit last found rightward, which is there vnder 2, and the other following in order leftward if there be mo. Note oftentimes as it is said in the square, the number aboue the threefold leftward is so bigge, that with ease the Radical Digit cannot be found. Therfore suppose this 0 to be betwene your Parallels in stead of your Digit, a roome beyond all the threefold rightward. The resulting then of your Quotient increase by the threefold number, and with the summe that surmounteth, diuide the Characters aboue the threefold and so leftward, the Quotient of that partition appeareth to be the Digit, so that the remain of that diuision, ioyned with the element, vnder whom the Digit must be put, be moze or equall compared with the cubicall multiplication of the last found digit. Otherwise 1 or 2 lesse at y^e most wil serue. The next digit on this wise found, being here 6, let him be augmented together with the first in the threefold number 9, thus 36 in 9, maketh 324,

and the same againe with the last found digit multiplied, so haue you 1944 to be subtracted from aboue the threefold 9, and so leftward, which number is 2242, then remaineth 298, the figure 8 to be set ouer the head of 2. This 6 the last Digit found, and so all other, must be placed immediatly (when it is serched out) euer a place farther betwene the Parallels rightward than any figure of your double, that is at all times vnder the Element next to the Pendent line. Now multiplie 6 Cubically, which is 216 to be Subtracted from the Characters aboue him and leftward, so remaineth 2764, wherefore the number wrought, is not Cubicall. Note whē your Unite is too much to be put in your Quotient, then let this Ciphre 0 take place, and so procede to the end, tripling as afoze all your Radicall Digits. This which is said, sufficeth for all manner numbers, much vse rather than many words is here required.

Another precise way for the finding
of this Cubicall Roote.

Adde toward the right hand, as is said in numbers Square, to any summe so many Ciphres as you list, so that those added Ciphres may be diuided in threë parts equally, as 000, 02 000, 000, 02 else 000, 000, 000, that is 3 at the least 6 02 9. Of the number that surmounteth take the Cubicall Roote, as aboue is said, the Remaines nothing regarding. Pull away toward the right hand so many Elements as $\frac{1}{3}$ third part of the afoze added Ciphres amount to, the other leftward keepe as the Integers of your *Radix*. Now with these Elements pulled away, worke as is said in numbers Square in the second finding, euer cutting away toward the right hand so many elements as the third part of the afoze added. Better it is, if you worke still by one Article.

How

How the Denominator is found to the Remaines Cubicall.

You shall first square your Cubicall *Radix*, that square triple, Triple also the *Radix*. Adde these triples together, adioyning 1 to the resulting summe, maketh the Denominator.

Do multiplie the *Radix* in the triple of an number, one Unite bigger thā the said *Radix*, and to the product of that Multiplication, adioyne an Unite, so haue you the desired Denominator.

Do adde an Unite to your *Radix*, & encrease the resulting summe by your *Roote* Cubicall, this product triple, & adde thereto an unite, so ariseth the Denominator also.

This Denominator shalbe placed vnder a streight line, drawn at the right hand of your Quotient, as in the last Example you may behold. Then set ouer the same the remaine of your *Roote*, so haue you a Fractiō, whose nature you shall immediatly know.

The prooues of all the kindes afore mentioned. Chap. 10.

The contrary kinde is the true examination of the other, as by

{ Addition } { Subductiō } { Multipli. } { Augmentatiō }
{ Subtractiō } { Collection } { Diuision } { Partition. } is proued

Although this suffice for breuitie, yet I shall at large put forth the prooues.

After you haue added your numbers together, pull out any summe or row there contained, the other summes not subtracted, shall remaine, if you haue well done.

Adde the nūbers which you did subtract vnto the Product, and it shall be equall to the first summe.

¶ it

Divide the Product either by the Multipliator, or the number to be multiplied, and the other part sheweth himselfe.

Multiply the Quotient with the Divisor. If the number that surmounteth with the rest remaining, make your number that was divided, you have rightly done.

When grosse into subtile is brought, Division by the Multiplier bringeth the great former summe. Subtile in grosse wrought in like maner. Multiplicatio proueth it.

Out of the whole summe gathered, subtract euery number in the row, the last subtracted, nothing shall remaine.

The Rote or *Radix* in himself must be multiplied, and if there be any thing left, let it be added to the Product, so haue you the first summe.

Euen so the Cubicall *Radix*, augmented in himselfe cubically, adding the remaines, yeldeth the former summe.

The false proofes by nines, Multiplication in squares, Divisions peculiar to one forged dividend, accompting by Counters, and such like, are here omitted, because they doe rather trouble, yea lade wittes than profite.

Thus endeth the first part, teaching the supputation of Integers, and here followeth the second of Fractions.

CHAP. XII.

The expressing of the vulgar or common *Fractions*.

A Fraction is a Distributio, appointed of a part or parts of an Integer. As the Integers take their beginning at 1, and continue in number without end, euen so the said Integers, by imagination from one second part, may be dissolued, or broken in portions or parts infinite. The parts of those simple or principall Fractions, haue also to them parts following. To attain the knowledge of them, acquaint your selfe with these two termes, Numerator, and Denominator. The office and duetie of the first, is, to expresse

expresse the number of such partes . The Denominator doth giue to those partes their names , as $\frac{1}{4}$ which is three portions of a thing diuided in 4 . The Numerator is called Elementes or Figures that be alway set aboue the short line . The Characters or Elements vnder, beare the name of y Denominator . The Numerator is at all times first pronounced , as $\frac{2}{3}$ $\frac{3}{4}$ $\frac{1}{5}$ as two thirdes , three fourthes , one fift . Simple or principall Fractions be euer as afoze written , but fragments of Fractions thus , $\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$ and num- bzed on this wise , two fourthes of one fift , of one sixt : note these Fractions following $\frac{1}{4}$ $\frac{10}{9}$ $\frac{1}{3}$. The last being left- ward , maketh one whole , the Numerator being as much as the Denominator , the other following , giueth one Integer , and one ninth , the Numerator exceeding the Denominator by the ninth part . The third wanteth one Unite to create a whole , the Numerator being desti- tute of one third . The bigger the Denominator , the fur- ther the Fractions are from the whole . In Supputation , there doth assemble and runne together numbers both great and small , whole and broken , principall Fracti- ons , with Integers and Fragmentes of Fractions . Ther- fore of necessitie to auoyde confusion , I must first declare how to reduce diuers kindes into one fashon or like- nesse .

CHAP. XII. Of Reduction in Fractions.

TO reduce , is to bzing Integers into Fractions or con- trary , yea a fragment or Fractions of diuers Deno- minations into one , or what name you list . You shall re- duce integers or whole , into what part you wil , multiply- ing the integers by the denomination of those parts , as if I would breake 8 whole in thirds , multiply 8 by 3 , riseth $\frac{24}{3}$. If I would bzing 5 integers and $\frac{1}{4}$ into one name , I must

multiplie the Integers into the Denominator 4, adding to the Product 3, so haue ye $\frac{3}{4}$. To reduce partes of fractions into whole, diuide the Numerator of those fractions by the Denominator, as $\frac{3}{4}$ diuided by 4 proceedeth 6 Integers & $\frac{1}{4}$ of an whole. The remaines euer acknowledge their name of the Diuisor, and beare the proportiō to the whole (or Integer) of the Numerator to y Denominator, which was Diuisor. When ye will change great partes into the lesse, or contrary, ye shall multiply y Numerator of it that you entended to change, into the Denominator of it into whom ye will make the change, and whatsoeuer resulteth you shall diuide by the Denominator of it that ye began to change, so haue ye those partes which ye required, risen out of the Diuision.

Example.

I would reduce $\frac{1}{8}$ into seuenthes, augment 5 into 7 encrease 35, diuided by 8 sheweth in Partition 4, and 3 the remaine which signifieth $\frac{3}{8}$, so of $\frac{1}{8}$ brought into seuenths commeth $\frac{1}{7}$ and $\frac{3}{7}$ of one seuenth part. Whensoeuer in such Reduction there is left any remaine after the Diuision made, it is a Fragment of a fraction and shall take his name in the Nominatiue case of the Denominator of that which is the Diuisor, & receiue his other name in the oblique case of the Denominator into whō the change or reduction is made. Fragments of Fractions be thus brought into principall fractions. Multiply the Numerators in themselves forging one common Numerator. Also the Denominators by themselves, causing one Denominator in common, as $\frac{1}{8}$; $\frac{1}{7}$; so reduced bringeth $\frac{1}{56}$ of one Integer. To reduce two fractions to one principall Fragment multiply the one Denominator by the other, so haue ye produced a common Denominator. Then multiply the Numerator of the one fraction into the Denominator of the other, and agayne the Denominator of the other Fragment into the Numerator of the first

first, adding the Products together which shall be a Numerator in common. As thus $\frac{2}{3}$ and $\frac{1}{4}$. Multiply as above is said 3 in 4 that is 12 the common Denominator, then 2 the first Numerator augmented in 4 maketh 8. Put that 8 above $\frac{2}{3}$, then multiply 5 the Numerator of the second Fraction in 3 increaseth 15, the which note over $\frac{1}{4}$. These peculiar Numerators added together, riseth 23. Write over the 12 after this fashion $\frac{23}{12}$ so $\frac{2}{3}$ and $\frac{1}{4}$ make $\frac{23}{12}$ of the which 8 be made of $\frac{2}{3}$ and 15 of $\frac{1}{4}$. Behold.

The Example.

$$\left\{ \begin{array}{cc} 8 & 15 \\ \frac{2}{3} & \frac{1}{4} \end{array} \right\} \frac{23}{12}$$

Manie and diuers Fractions on this wise be brought to one simple Fraction. After ye haue produced two of the first Fragmentes as above, then multiplie the common Denominator (first reduced) into the Denominator of the next Fraction to be reduced. Of that riseth a Denominator in common. Now for your Numerator worke thus.

Ye shall multiply the Numerator of the first reduced into the Denominator of the third, which is to be reduced, and contrary the Denominator of the Reduct into the Numerator of the last Fragment to be reduced, so by Addition ye shall haue a Numerator in common, euen thus of all Fractions how many soener they are. The first alwayes dispatched, adioyne the next, untill ye haue perused them thoroughly.

Example.

$\frac{2}{3} \frac{1}{4} \frac{1}{5}$. After ye haue reduced the 2 first thus $\frac{23}{12}$ adioyne to him the next on this wise, $\frac{23}{12} \frac{1}{5}$. Now multiply the Denominators, commeth 24 the common Denominator.

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Then 23 by 2 encrease 46, and 12 by one multiplied yeldeth 12, 46 & 12 added make 58 the Numerator in common. Thus standeth your Fractions aboue written, reduced $\frac{58}{14}$ which containe 2 integers, and $\frac{10}{14}$ or $\frac{5}{7}$ of the integer. Mark well if integers, fractions, and fragments of fractions shal fortune to come together, bying them all to principall fragments, as aboue is declared, that done, performe every thing by the rules aforesaid.

CHAP. XIII.

The Abbreviation of Fractions.

TO abbreviate any Fragment, is to bying a Fraction to his least denomination. To make this abbreviation, ye must divide the Numerator of the Fraction, and so in the like maner the Denominator by the biggest number, that is some common part of them both. The Quotient by Division of the Numerator, sheweth the Numerator of the Fraction abbreviated. Likewise by partition of the Denominator his Fragment in the Quotient appeareth.

Example.

I would abbreviate $\frac{1}{2}$ divide 4, the Numerator by 4, which 4 so appeareth 1. Now 12 divided by that 4 ariseth 3, for the Denominator, which also have place thus $\frac{1}{3}$, being the least Denomination. This big number is found by dividing the Nominator, with the Numerator of the Fraction. If nothing be left of that partition, the Numerator or Divisor is that great number as afoze. When any thing remaineth, with that divide the number that afoze ye made your Divisor, & thus continue on till nothing remaine, so your last Divisor is that great number which serveth your turne. In case by oftē Partition your last Divisor cometh to an Unite, the those fractions or numbers be called *Contrase Primi*, and may not be reduced to any lower name.

How

How to know the value of remnants that be
left by Diuision of Integers or whole.

TO make short worke, reduce the Integer into the
most subtile Denomination that to him belongeth, the
multiply that reduction by the Numerator of the Fraction,
and diuide by the Denominator of the said Fraction, the
Quotient vttereth the value of the partes of Fractions.
Here needeth no example.

CHAP. XIIIIL Of Addition.

TO adde in common Fractions, is to gather and reduce
many Fragments to one summe of principall Fraction.
This is sufficiently entreated of before. Notwithstanding
I shall not spare here somewhat to say. If your Fraction
be of one Denominatio, then gather or adde the Numerators
together, subscribing the Denominator, as $\frac{1}{4} \frac{1}{4} \frac{1}{4}$
maketh $\frac{3}{4}$ which is 2 hole, and $\frac{1}{4}$, but being diuers & vnlike,
multiply the Numerators by the Denominators crosse
wayes, adding them together, so haue ye a common Numerator,
to whom subscribe a Denominator common.

Example.

$\frac{2}{3}$ and $\frac{1}{4}$ produce $\frac{11}{12}$ to the which ye may adde $\frac{1}{3}$ that maketh
a $\frac{17}{12}$, being 3 hole, and $\frac{1}{4}$. Note if Integers and Fractions
shall accompany together, first adde the Integers, after
the Fractions, & if the Fragments may create an Integer,
adiopne them to the other whole.

CHAP. XV. Of Subduction.

Subduction is the taking of the one Fraction from the
other, the lesse from the greater, or equall from the like

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or equall. Those fractions be named the greater, whose Numerator multiplied in the Denominator of the other, engendeth the greater number. Subtracte $\frac{3}{4}$ from $\frac{7}{4}$ remaineth $\frac{4}{4}$, which is one whole. When the Denominators be diuers as $\frac{1}{2}$ from $\frac{1}{3}$. Multiply 5 with 2 cometh 10 the common Denominator to be set vnder. Then foure times 2 yeldeth 8. In like maner three times 5 bringeth 15. Now Subtract 8 from 15 remaineth 7, the which hath place thus, $\frac{7}{6}$. When ye would Subtract $\frac{1}{4}$ from 4 Integers and $\frac{1}{2}$, the last fraction being lesse then $\frac{1}{4}$, enforceth you to Subtract one out of 4, resolving him into seconds, & adioyned to the other so haue ye $\frac{1}{2}$, from whom take $\frac{1}{4}$ remaineth $\frac{1}{4}$ abbreviated $\frac{1}{8}$, to whom adioyne 3 whole, it standeth thus, $3\frac{1}{8}$. If ye list to take 6 and $\frac{1}{3}$ out of 8 and $\frac{1}{4}$ the Integers being reduced into their proper fragments, make your Subduction as aboue is said, so remaineth 2 and $\frac{1}{12}$ of an whole.

CHAP. XVI. Of Multiplication.

Multiply the Numerators together in themselves, then the Denominators, so haue ye both a Numerator and a Denominator in common.

Example.

$\frac{2}{3}$ and $\frac{1}{2}$ by $\frac{1}{4}$. Two times 3 maketh 6, once 6 yeldeth 6 which multiplied in 4 bringeth 24, the common Numerator. Then three times 4 increaseth 12, that augmented in 2 engendeth 24 and so in 5 surmounteth 120, the Denominator in comon, which all standeth thus, $\frac{24}{120}$, but abbreviated in this wise, $\frac{1}{5}$. Three Integers by $\frac{2}{3}$ or contrary be thus multiplied, the Numerator of the fraction multiplied in 3 bringeth 6, which 6 must be writte ouer the Denominator of the fragment thus $\frac{6}{3}$ or 2 Integers. Integers by multiplication grow both in quantitie and number, the fraction

tion increaseth only in number and diminisheth in quantity. Note when whole be ioyned with simple Fractions onely, or with Integers coupled with Fragments, or else contrarie, Reduce the Integers & ioyne them to their proper Fraction, and after multiply them according to the Art of Fragments.

CHAP. XVII

Of Partition.

If your Fractions be of one Denomination, diuide as in Integers, putting the remaines ouer the diuisor. I would diuide $\frac{4}{3} \div \frac{2}{3}$ the quotient bringeth forth 1 whole, and $\frac{2}{3}$. Let your Diuisor be euer placed on the left side. When the Denominators be vnlike, ye shall multiply crossewise as by $\frac{2}{3}$ diuide $\frac{4}{3}$. Augment 3 in 4 there commeth 12 the Numerator, then 8 by 2 riseth 16 the Denominator, they haue place thus $\frac{12}{16}$ & abbreviated on this wise $\frac{3}{4}$. When Integers commeth to be diuided by simple or principal Fractions or contrarie, the Integers ought to be set aboue the line after the manner of Fragments putting vnder the Unite, the Diuident (as I haue said) occupying the left side. Now worke as aboue ye haue learned in diuision of Fractions.

Example.

By $\frac{2}{3}$ diuide $\frac{4}{3}$ riseth $\frac{2}{3}$ abbreviated thus $\frac{1}{3}$. Another example by $\frac{2}{3}$, part $\frac{4}{3}$ so commeth $\frac{2}{3}$ which is 7 Integers and $\frac{1}{3}$.

If Integers with principall Fractions yea or Fragments of Fractions come to be diuided by Integers or whole which be accompanied with simple, broken, or Fractions of Fragments, when the broken are reduced to a simple Fragment, & the Integers to the same kind that his ioyned Fraction is of. Then perfoyme your Partition as afoze is said.

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Of the Quadrate Roote.

If ye may, take the Quadrate roote both of the Numerator and Denominator, as in the Integers: for example thus, of $\frac{4}{9}$ the Quadrat roote is $\frac{2}{3}$. Now followeth a generall way for all manner of fractions.

Suppose a number and multiplie it with the Denominator of your fraction, the product shall be the Denominator of the *Radix*. Then for your Numerator, multiply the number afoze supposed in himself, and that which redoundeth augment in $\frac{1}{2}$ Denominator of the fraction, the product multiply in the Numerator of the fragment, then of that mounting sum, take the Roote as is said in the eight Chapter of this first booke, which is the *Radix* of the Numerator. Now place the one over the other abbreviating if neede be. The example of the Cubicall roote following, maketh this which I haue said, manifest.

CHAP. XIX.

Of the Cubicall Roote.

For the Cubicall roote worke thus. Example $\frac{2}{3}$ let your number supposed be 6, with it multiply 29 riseth 174 $\frac{1}{2}$ Denominator. Now increase 6 in himself Cubically cometh 216, which augmented with 29 bringeth 6264, the product, againe multiplied by 29 engendreth this sum 181656 which to conclude, multiplied in the Numerator of your fraction, surmounteth this 1816560. Now the *Radix* Cubicall found (as is mentioned in the ninth Chapter of this booke) sheweth your Numerator which is 122. Put your Denominator vnder him thus, $\frac{122}{174}$ abbreviated maketh $\frac{2}{3}$ and $\frac{2}{162}$ of an whole. Thus get the Cubicall roote of all other fractions.

Of

Of the Rule of Proportion, commonly
called the Golden Rule.

This Rule is also called the rule of three, for as much as by three proportionall numbers knowne, it alway searcheth out the fourth proportionall, as if nine yards of Veluet cost eleuen pounds, what shall 33 of the same cost. Here are three numbers giuen, and a fourth demaunded. For the resolution of this and all such like, worke by the Rule ensuing.

The Rule.

Multiplye the last number by the second, and diuide the Product by the first number, so wil your Quotient and remaine discover the fourth proportionall desired.

The demonstration of this Rule is grounded on the 19 Proposition of the seauenth Booke of the Geometricall Elements.

Example.

I multiplie 33 by 11, there ariseeth 363, which diuided by 9, yeldeth in the Quotient 40, and in the remaine $\frac{3}{5}$, which reduced, maketh $\frac{1}{5}$, I conclude therfore 33 yards of the same Veluet shall cost fortie Pounds, and a Poble.

$\left\{ \begin{array}{l} \text{If 9 yards of} \\ \text{Veluet cost} \end{array} \right\} 11 \text{ Poun des, } \left\{ \begin{array}{l} 33 \text{ yarde s} \\ \text{will cost} \end{array} \right\} 40 \frac{1}{5} \text{ Poun des.}$

But in placing of the three numbers this must be obserued, that the first and third be of one Denomination, as in this question they are both Veluet, and that the numbers proponed for a paterne, be first placed, and the number, whose fellow you seeke, be alwayes placed last. Here I tearme first and last, according to our vsuall manner of writing from the left hand to the right, and not as in Numeration.

The

The Rule of Proportion

Inuerfed.

The Rule is termed Inuerfed, when the question is fo propounded, that according to the courfe of the numbers, the fourth fhould furmount the thirde, and yet in reafon it muft in deed be leffe, or contrariwife by courfe of numbers diminifhing, when it ought to encrease: As if twelue Men fhould be able to make a certaine wall in twentie dayes, how many fhall make the fame in five dayes.

*{ The numbers
in order placed. }* If 20 dayes giue 12 mē, what yeldeth 5 days.

Here it is apparant, that by the courfe of thefe numbers, as 12 is leffe than 20, fo the fourth fought fhould be leffe than five, and therefore confequently much leffe than 12 dayes, but reafon teacheth me, that if twelue men be 20 dayes about a peece of worke, to difpatch the fame in leffe time, it behoueth me to haue more than twelue men. The courfe of numbers therefore, and the truth in reafon being repugnant, I muft worke by the Rule of proportion inuerfed. That, is to multiply the firft by the fecond, and diuide by the third.

Example.

20 multiplied by 12, produceth 240, which diuided by five, yeldeth 48. So many mē I fay are to be employed to finifh the wall in five dayes, and therefore the question refo- lued, ftandeth thus:

*{ If 20 dayes be { the worke by 12 men, then to finifh it in five
required to finifh { dayes, you muft provide 48 men.*

The

STRATIOTICOS.

The Golden Rule double wrought.

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Sometime questions are proponed, wherein the Rule of Proportion must be twice wrought, before the question can be resolved. As if five Cannons at a batterie spend 60 Barrels of Powder in two dayes, how much Powder will suffice for foureteene Cannons for five dayes. Their numbers you must dispose in order as followeth, so as the first and last be alwayes in euerie operation of one Denomination.

*If five Canons spend 60 Barrels, what shall 14 Canons.
If two dayes require 168 Barrels, what shall 5 dayes.*

Thus you see the first and last in either row of numbers, to answer in Denomination. In the first Cannons. In the other dayes: And of your five numbers proponed, three placed in the first row, & two in the second, leauing a space in the middle for the fourth proportional to be found thus. I multiplie as before taught 14 in 60, ariseth 840. which diuided by 5, yeldeth for the fourth proportionall 168, which I place for the second or middle number in the second row, and then multiply againe 168 by 5, so haue 840, which diuided by two, yeldeth in the Quotient 420, so manie Barrels of Powder will suffice foureteene Cannons for five dayes Batterie.

I forbear in this place farther to entreate of the appli-
ance of this Rule, whose vse shal in many Militare que-
stions hereafter be declared. And for that my chiefe in-
tention in this Treatise is to shew how *Arithmetike* may
stand a souldier in steade, I forbear to intreate of the
Rules of Alligation, and false positions, as things fri-
uolous for that purpose, and meane onely to open so
much of the Arte of *Algebra*, and first *Equations*, as
shall to that ende be requisite, reseruing the more

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exquisite handling of the curious *Cubicall Equations*, and secret Demonstrations of that Art, to a peculiar treatise, wherein I will prosecute the method of *Cardanus* in his tenth Booke, and supply (God sparing life) the imperfections thereof.

Here ensueth the second Booke, teaching al these Arithmeticall kinds in numbers Denominate, commonly called Collicall, with certaine new Characters, inuented and practised by my Father, for the moze speedie dispatch in the working of supputations Algebraicall. It containeth also certaine Equations necessarie to be knowne, for the resolution of such Militarie questions, as in the end of the same Booke are adioyned, touching the chiefe officers of the field.



The second Book.

CHAP. I.

A briefe Treatise of that part of Algebra
that concerneth Cossicall, or
Denominate Numbers.



As in common Arithmetike all Abstract numbers take their original from the Vnite, so in these kind of concrete or Denominate numbers, we take our beginning from a *Radix* or Roote, not improperly so tearmed, sithens out of the same, as from the very base and roote are deriued infinite bzaunches of these Cossical numbers. And as in common numbers we procede from the Vnite by Addition, to create all kinde of Numbers, so in this Arte of Numbers Cossicall, we procede from the Roote by Multiplication, to create all Squares, Cubes, Zenzizenzike, and Surd Solides, with all other that in this Science are vsed, the which by Example may best be explained.

1	2	3	4	5	6	7	8	9	10	11	12
Roo.	Sq.	Cu.	SqS.	Sfo.	SqC.	B/S.	SSSq.	CC.	S/S.	C/S.	SSC.
2	4	8	16	32	64	128	256	512	1024	2048	4096

Any Number Abstract may be a Roote, and according to the value and quantitie thereof, all the other Cossicke Numbers in value & quantitie alter. For Example sake, I do here suppose the Roote 2, the which multiplied in it selfe, maketh 4 his Square, with his Character ouer his

Cij

head, that *Sq.* augmented againe in his Roote, maketh 8 his Cube, and his Character ouer his head. Of these are all the rest componed. For the Square being four, againe squared, maketh his Squared square 16, with his Character ouer him. The next being not made by the Square or Cubike, Multiplication of any of the former, cannot take his name from Square or Cube, and is therefore called a Surd solide, and is onely created by Multiplicatiō of 2 the Roote, in 16 the *SqS.* making 32 with his cōuentent Character ouer him, & for distinctiō is tearmed by first Surd solide. Again, 8 being the *Cu.* squared, maketh 64, & next number ensuing in Geometrical Progression, with his Character componed of *Sq.* and *Cu.* called a Squared Cube, the next being 128, is not made of Square or Cubike Multiplication of any, but only by the Multiplication of the Squared Cube in his Roote, and therefore is tearmed the B.S. solide, or second S. solide.

Whereof you may collect this Rule vniuersall, to giue name to any of these Cossike Solides: consider what simple or vncompound numbers the number of the Solide may be resolued into, and of the Characters, to those Numbers appertaining he shall be componed.

Example.

Of the first Cossicall number, 6 is componed of 2 and 3, 2 is the *Sq.* 3 the *Cu.* I conclude therfore the first is a *S. Cube*, likewise of the eight, 8 is made of 2, 2 and 2 therefore I inferre, that the eight Character shall be a *S.S. Square*. Again, 10 is made of 2 and 5 a *SS*, the tenth therefore shall be a *Sq.S Solide*, and thus of all other.

This I haue rather added for custome sake, because in all parts of the world these Characters & names of *Sq.* and *Cu.* &c. are vsed, but because I find another kind of Character by my Father deuised, farre more readie in Multiplications, Diuisions, & other Cossicall operations, I will not doubt, hauing Reason on my side, to dissent from common custome
in

in this point. and vse these *Characters* ensuing:

\mathcal{H} \mathcal{H} \mathcal{A} \mathcal{X} \mathcal{D} \mathcal{Y} \mathcal{O} \mathcal{P} .

\mathcal{H} for a *Roote*, \mathcal{H} for a *Square*, \mathcal{A} for a *Cube*, \mathcal{X} for a *Squared Square*, \mathcal{X} for a *S. Solide*, \mathcal{D} for a *Squared Cu.* and so of the rest, vsing onely the ordinarie *Figures*, but somewhat turned a contrarie way, bycause they should be discerned, and not confused among others, and these shall be named *Primes*, *Seconds*, *Thirds*, *Fourthes* &c. according to their *Figure* or *Character*.

CHAP. II.

Of Addition of Numbers Cossicall.

When Numbers Cossicall are presented to be added, either it is of one or of mo, of one thus. I would adde 5 \mathcal{H} to 20 \mathcal{H} in this case \mathcal{H} Characters being like, you shall onely adde \mathcal{H} Numbers adioyning to the Character, so find ye that two Cossicall numbers ioyned, make 25 \mathcal{H} : but if the Characters be different, as 10 \mathcal{H} to be added to 16 \mathcal{A} , then shall you ioyn the with this signe + Plus, saying they make added 10 \mathcal{H} + 16 \mathcal{A} , that is to say 10 seconds more 16 thirds: for being of different Characters, they cannot be otherwise expessed, but if they be many to be added together, the shall you dispose the one vnder another, matching alwayes like Characters together. For Example, I would adde 20 \mathcal{H} + 30 \mathcal{H} + 25 \mathcal{X} vnto 45 \mathcal{H} + 16 \mathcal{H} + 13 \mathcal{A} .

In Addition of these kind of numbers, I begin fro the left hand, saying 20 and 45 make 65, whereto I adioyne their common Character \mathcal{H} . Likewise 30 and 16 make 46, I adioyne \mathcal{H} their common Character.

$$20 \mathcal{H} + 30 \mathcal{H} + 25 \mathcal{X}$$

$$45 \mathcal{H} + 16 \mathcal{H} + 13 \mathcal{A}$$

$$65 \mathcal{H} + 46 \mathcal{H} + 25 \mathcal{X} + 13 \mathcal{A}$$

And bycause these numbers are both noted wth this signe +, I adde also that Signe. Last of all, bycause 25 and 13 doe

differ in Character, I may not adde their numbers, as in the other, but put them downe with the signe + as in the Example you may behold.

Againe, it happeneth sometime, that albeit the Characters agree, yet the Signes differ, as in this second Example.

$$\begin{array}{r} 10 \text{ } \mathcal{H} + 25 \text{ } \mathcal{H} - 12 \text{ } \mathcal{X} \\ 13 \text{ } \mathcal{H} - 22 \text{ } \mathcal{H} + 16 \text{ } \mathcal{X} \\ \hline 23 \text{ } \mathcal{H} + 3 \text{ } \mathcal{H} + 4 \text{ } \mathcal{X} \end{array}$$

Here first 10 \mathcal{H} and 13 \mathcal{H} make 23 \mathcal{H} , but because in the next the Signes are different, I must deduct the lesse from the bigger, so remaineth 3, to the which I adde + viz. the Signe of the greater number. Againe, the next having different Signes, I subtract the lesse out of the greater, there remaineth 4 \mathcal{X} whereto I annex + being the Signe of the greater. And thus the Addition appeareth to be 23 Primes + 3 secondes + 4 \mathcal{X} . Here is all the difficultie in this kinde to vse Subtraction, when the Signes differ, and set downe the Signe of the greater, the which in one short sentence is expressed by Scyfelius.

Diversa Signa commutant speciem, Aponit M.

One Example more I thinke good to adioyne, to remove all scruple or doubt that may arise. These Operations conferred with the Rules of Addition ensuing, are manifest, and neede no further Explanation.

$$\begin{array}{r} 4 \text{ } \mathcal{X} + 25 \text{ } \mathcal{H} - 13 \text{ } \mathcal{H} \\ 6 \text{ } \mathcal{X} - 20 \text{ } \mathcal{H} + 12 \text{ } \mathcal{X} \\ \hline 4 \text{ } \mathcal{X} + 6 \text{ } \mathcal{X} + 5 \text{ } \mathcal{H} + 12 \text{ } \mathcal{X} - 13 \text{ } \mathcal{H} \end{array}$$

The Rules of Addition.

If the Signes be like, subscribe the same Signe.

If unlike Subtract, & to the Remaine adioyne the greater Numbers Signe.

Of

CHAP. III.
Of Subtraction.

The like different difficulties are also in Subtraction, but by one exāple cōtayning euery particular varietie that can chance, I thinke better briezly to teach than by vsing many woordes in euident matters to be tedious.

The rules of Subtraction.

Like Signes produce their like, except the greater nūber be from the lesse to be subtract, then change the Signe and set downe thereto the Difference.

Contrarie Signes in stead of *Subtraction*, requireth *Addition*, and to the *Product* adde the vpper numbers Signe.

$8 \text{ } \mathcal{H} + 12 \text{ } \mathcal{H}$	$8 \text{ } \mathcal{A} - 2 \text{ } \mathcal{H}$	$-7 \text{ } \mathcal{H} + 10 \text{ } \mathcal{H}$
$4 \text{ } \mathcal{H} + 10 \text{ } \mathcal{H}$	$2 \text{ } \mathcal{A} + 2 \text{ } \mathcal{H}$	$+ 5 \text{ } \mathcal{H} + 12 \text{ } \mathcal{H}$
$4 \text{ } \mathcal{H} + 2 \text{ } \mathcal{H}$	$6 \text{ } \mathcal{A} - 4 \text{ } \mathcal{H}$	$-12 \text{ } \mathcal{H} - 2 \text{ } \mathcal{H}$

Behold in these three Examples ye haue as many varieties as in Subtraction can happē, wherein this is to be noted, that howsoeuer \mathcal{H} nūbers are deliuered, ye may alter and transpose them, so as like Characters be matched together, alwayes keeping with them their cōuenient Signes, and placing alwayes the number to be Subtracted vnder, and the other aboue. In the first Example we see the Signes alike, deduct therefore one from the other, there remaineth first $+ 4 \text{ } \mathcal{H}$ and in the second $+ 2 \text{ } \mathcal{H}$. But in the second part of the secōd Example, the Signes are different. In stead therefore of Subtracting I adde, so amounteth $4 \text{ } \mathcal{H}$ whereto I adioyne the Signe $-$ bycause it is \mathcal{H} vpper numbers Signe. Again in the third, bycause the Signes are diuers in the first part by Addition I finde $-12 \text{ } \mathcal{H}$. But in the secōd part albeit the Signes be one yet the greater nūber being vnder, I adioyne a contrary Signe to the difference, saying the remaine is $-2 \text{ } \mathcal{H}$. And thus of all others.

STRATIOTICOS.
CHAP. IIII.
Of Multiplication.

For Multiplicatiō of Cosslike numbers ye shall adde together their Characters, and the resulting Character, set downe with the number produced of their numbers Multiplication, and so; the Signes these Rules ensuing must be obserued.

The same or like Signes multiplied produce + *Plus*.
Contrarie or diuerse Signes produce alway — *Minus*.

Every seuerall number of the Multiplier must be augmented in every number of the number to be multiplied, and the Productes with their correspondent Signes and Characters so placed, that like Characters be matched, and finally by Addition the whole collected.

Behold the Example.

First I say 6 times 4 makes 24 and *Primes* added to Thirdes make Fourthes. I set downe therfore 24 γ . Again 6 times 12 make 72 and *Primes* added to Seconds, make 3, I set downe therfore 72 Thirdes, and in both these numbers the Signes being like, I set downe +

$$\begin{array}{r}
 4 \gamma + 12 \psi - 4 \mu \\
 6 \mu + 12 \gamma - 3 \gamma \\
 \hline
 + 48 \gamma + 24 \gamma + 72 \gamma - 24 \psi + 144 \chi - 12 \mu \\
 - 36 \gamma - 48 \gamma \qquad \qquad \qquad + 12 \chi \\
 \hline
 24 \gamma - 24 \gamma + 72 \gamma - 24 \psi + 156 \chi - 12 \mu
 \end{array}$$

Againe 6 μ in 4 μ make 24 ψ , but bycause the Signes are differēt I adde to those 24 ψ the Signe —. This done, I dash 6 with the penne, and go to the next Section or member of my Multiplier *Viz.* 12 γ saying 12 γ in 4 γ produce 48 Sixes, I set downe therfore + 48 γ , Againe 12 γ in

in 12 $\frac{1}{4}$ produceth 144 \times the Signes being like I addine +
 Againe 12 \times in 4 $\frac{1}{4}$ maketh 48 \times and the Signes being
 unlike I set downe—. This 48 \times I set directly vnder 24
 \times in the vpper line. Againe dashing out 12 \times I say 3 \times in
 4 \times makes 12 $\frac{1}{4}$ the which set in the bpmost line bycause
 there is none his like to set him vnder.

Againe 3 \times in 12 $\frac{1}{4}$ maketh 36 \times which I subscribe
 vnder the Sixtes in the vpper line adding the Signe — by-
 cause the Signes are diuers.

Finally 3 \times in 4 $\frac{1}{4}$ make 12 \times the which I set vnder
 the Fiftes in the first row, adioyning the Signe +, bycause
 both their Signes be like. And so drawing a line by Addi-
 tion, I finde the Product of that multiplicatio 24 \times + 156
 \times + 72 \times — 24 \times — 24 $\frac{1}{4}$ — 12 $\frac{1}{4}$. In like sort of all o-
 ther soz no other change can happen that you are not in-
 structed in by this Example.

CHAP. V. Of Diuision.

The Diuision of numbers Cossicall is not vnlike to the
 Diuision of common numbers in respect of placing
 the Diuisor, and as in Multiplication the name to the
 Character resulting was giue by adding together the two
 Characters of the multiplier and multiplied number, so
 here the Character of the Quotient is found Subtracting
 the Character of the Diuisor from the Character of the Di-
 uident, as by the Example ensuing moze plainely appea-
 reth: the Rule of the Signes is all one in Diuision with
 those of Multiplication.

Like

+ Like Signes giue +, Vnlike —.

The Nūber diuisible. $60 \times + 72 \alpha - 80 \times - 96 \frac{1}{4} | 6 \frac{1}{4} - 8 \frac{1}{4}$ Quotiēt

The Diuisor. $10 \alpha + 12 \frac{1}{4} \quad 10 \alpha + 12 \frac{1}{4}$

$60 \times + 72 \alpha$

The Numbers thus digested, I search how oft 10 in 60, I finde 6 which I put in the Quotiēt adding this Character Seconds, by causes Thirdes frō Fiftes leaue Seconds, that Quotiēt multiplied in my whole Diuisor, maketh $60 \times + 72 \alpha$ which Deducted frō the Diuisible, leaueth 0. I remoue my Diuisor to p next, searching againe how oft 10 in 80 I finde 8, the which I put in the Quotient with his Character $\frac{1}{4}$ by cause 3 frō 4 leaues 1. And soz as much as the Characters are vnlike I set down — multiply therfoze — $8 \frac{1}{4}$ in that Diuisor, there resulteth $80 \times - 96 \frac{1}{4}$ the which Deducted from the Diuisible leaueth nothing, I conclude therfoze $6 \frac{1}{4} - 8 \frac{1}{4}$ my Quotiēt. The which I may proue whether it be true two wayes, either multiplying the Diuisor with this Quotiēt, so shall you produce the Diuisible number. Or diuiding the same Diuisible by your Quotient, so shall your first Diuisor in the new Quotient be created

Example.

$$\begin{array}{r} 60 \times - 80 \times + 72 \alpha - 96 \frac{1}{4} | 10 \alpha + 12 \frac{1}{4} \\ 6 \frac{1}{4} - 8 \frac{1}{4} \quad 6 \frac{1}{4} - 8 \frac{1}{4} \end{array}$$

I finde 6 in 60 contained iust 10 times. Put 10 in the Quotient with the Character α by cause 2 out of 5 leaueth 3. Now 10α multiplied in the Diuisor maketh $60 \times - 80 \times$ which Deducted from the corresponding part of the Diuisible leaueth 0. The Diuisor remoued I search againe how oft 6 in 72, I finde iust 12, that I put in the Quotient with the Character $\frac{1}{4}$ Primes, by cause 2 from 3 leaueth 1, and the Signes being like, I adde + this 12 multiplied

plied in 6 $\frac{1}{4}$ — 8 $\frac{1}{4}$ createth 72 $\frac{3}{4}$ — 96 $\frac{1}{4}$ which deducted from the second part of the Diuisible number, leaueth 0. Thus haue ye in the Quotient brought forth your first Diuisor, & therfoze are assured, both your works agreeing, that you haue not erred. But if it happen that either the Characters agree not, or the Signes and numbers so repugne as ye can not vse this ordinarie course of Diuision, the place them as a Fraction, drawing a line, and setting the Diuisible aboue, and the Diuisor vnderneath. These kinde of Cossicall Fractions haue their peculiar Rules, which shall hereafter ensue by itselfe, and so to Equation.

CHAP. VI. Of Fractions Cossicall.

THe selfe same Rules that were taught for Addition, Subtraction, Multiplication, and Diuision of common Fractions, serue also in these Cossicall Fragments, as by these Examples ensuing shall appeare.

Examples of Addition.

The numbers Added.

$$\begin{array}{r} 36 \frac{3}{4} + 16 \frac{7}{8} \quad | \quad 9 \frac{1}{4} + 4 \frac{1}{4} \quad | \quad \text{Added } 6 \frac{1}{4} - 3 \frac{1}{4} \quad | \quad 18 \frac{1}{2} - 9 \frac{7}{8} \\ \hline 12 \frac{1}{2} \quad \quad 3 \frac{3}{4} \quad \quad 10 \quad \quad 4 \frac{1}{4} \quad | \quad 12 \frac{1}{2} \end{array}$$

The Product. $18 \frac{1}{2} + 36 \frac{3}{4} + 7 \frac{7}{8}$

$12 \frac{1}{2}$

Multiply the Denominators, so haue ye 12 $\frac{1}{2}$ the comon Denominator, then crosse Multiplication of 4 $\frac{1}{4}$ in 9 $\frac{1}{4} + 4 \frac{1}{4}$ makes 36 $\frac{3}{4} + 16 \frac{7}{8}$, & 3 $\frac{3}{4}$ in 6 $\frac{1}{4} - 3 \frac{1}{4}$ makes 18 $\frac{1}{2} - 9 \frac{7}{8}$. These added make this Fraction.

$$\frac{18 \frac{1}{2} + 36 \frac{3}{4} + 7 \frac{7}{8}}{12 \frac{1}{2}}$$

$\frac{18 \frac{1}{2}}{12 \frac{1}{2}}$

Examples

Examples of Subtraction.

*The Fraction
subduced*

$$\begin{array}{r} 16 \text{ } \mathfrak{A} + 24 \text{ } \mathfrak{X} \mid 4 \text{ } \mathfrak{H} + 6 \text{ } \mathfrak{H} \text{ Deducted } 3 \text{ } \mathfrak{H} - 2 \text{ } \mathfrak{H} \mid 24 \text{ } \mathfrak{X} - 16 \text{ } \mathfrak{X} \\ 32 \text{ } \mathfrak{X} \mid 8 \text{ } \mathfrak{A} \text{ from } 4 \text{ } \mathfrak{H} \mid 32 \text{ } \mathfrak{X} \\ 24 \text{ } \mathfrak{X} - 16 \text{ } \mathfrak{A} - 40 \text{ } \mathfrak{X} \text{ The Remaine.} \\ 32 \text{ } \mathfrak{X} \end{array}$$

Examples of Multiplication.

$$\begin{array}{r} 6 \text{ } \mathfrak{H} + 3 \text{ } \mathfrak{A} \text{ Multiplied by } 10 \text{ } \mathfrak{X} \text{ Produceth } 60 \text{ } \mathfrak{X} + 30 \text{ } \mathfrak{A} \\ 4 \qquad \qquad \qquad 8 \text{ } \mathfrak{H} \qquad \qquad \qquad 32 \text{ } \mathfrak{H} \\ 5 \text{ } \mathfrak{H} + 32 \text{ } \mathfrak{A} \text{ Mul. } 8 \text{ } \mathfrak{A} + 10 \text{ } \mathfrak{H} \text{ Produ- } 256 \text{ } \mathfrak{X} + 360 \text{ } \mathfrak{X} + 50 \text{ } \mathfrak{X} \\ 7 \text{ } \mathfrak{A} - 20 \text{ } \mathfrak{H} \text{ by } 6 \text{ } \mathfrak{H} - 28 \text{ } \mathfrak{A} \text{ ceth. } 602 \text{ } \mathfrak{X} - 196 \text{ } \mathfrak{X} - 120 \text{ } \mathfrak{H} \end{array}$$

Examples of Diuision.

$$\begin{array}{r} \text{By } 4 \text{ } \mathfrak{H} \text{ I wold diuide } 16 \text{ } \mathfrak{X} + 15 \text{ } \mathfrak{H} \text{ ariseth of that } + 8 \text{ } \mathfrak{X} + 45 \text{ } \mathfrak{H} \\ 3 \qquad \qquad \qquad 9 \text{ } \mathfrak{H} \qquad \qquad \text{Diuision} \qquad \qquad 36 \text{ } \mathfrak{A} \\ \text{The Diui. } 10 \text{ } \mathfrak{H} \text{ The num. to } 12 \text{ } \mathfrak{H} + 4 \text{ The Quo- } 192 \text{ } \mathfrak{H} + 64 \\ 16 \text{ be deuided. } 12 \text{ } \mathfrak{H} \text{ tient. } 120 \text{ } \mathfrak{A} \end{array}$$

These Examples are wrought euen in like sort & forme as the Fractions of Abstract Numbers, and their multipli-
catiō in respect of Signes and Characters, nothing differeth
from that which already hath bene declared in Integers
Cossicall.

For examinatio of all these kinds as well Integers Cossi-
cal as Fragmēts, this one Rule sufficeth. Admit any num-
ber what ye list for a Roote or Prime, & thereby set down in
Abstract numbers the value of euery other Cossicall nūber.
Then

Then with those *Abstract* numbers adde, *Subtract*, multiplie or diuide, and confer the *Productes* with *Cossical* numbers produced by these foretaught *Operations*: If they agree, it sheweth a veritie. If ye finde repugnance, Repetition in either kind discouereth where the error resteth.

Of Reduction. Chap. 7.

Reduction is two wayes understood, either to Reduce a Fraction to his least Denomination, or else to Reduce two Fractions of diuerse Denominations to one & the same Denomination.

The first is performed by diuiding both Numerator and Denominator by the greatest common Diuisor that may be found.

The latter by crosse Multiplication of the Numerator of one in the Denominator of the other, wherby resulteth 2 new Numerators, & then multiplying the Denominators one in another, is Produced the common Denominator.

Example.

I desire to reduce $\frac{16}{12}$ to a lesser Denomination, I diuide therefore both Numerator and Denominator by 4, so ariseth this Fraction $\frac{4}{3}$ Equal to the former Fraction.

Or if it happen that diuerse Fractions be coupled together by + or — diuide euerie member severally by the greatest common Diuisor. Thus: $\frac{16}{12} + \frac{15}{12}$ is Reduced to $\frac{4}{3} +$

$\frac{5}{4}$ diuiding the first number of the Fraction by 4 and the latter part by 3. And thus of all such like.

The latter kind of Reduction by crosse Multiplication is already shewed in the Examples of Addition: but for more plainesse I will giue one other Example.

¶ It

$\frac{32\mathfrak{A}}{3\mathfrak{H}}$ and $\frac{8\mathfrak{X}}{4\mathfrak{H}}$ Reduced to one Denomi- } $\frac{48\mathfrak{X}}{12\mathfrak{A}}$ $\frac{24\mathfrak{X}}{12\mathfrak{A}}$
 nation stand thus.

Here $3\mathfrak{H}$ multiplied in $4\mathfrak{H}$ make $12\mathfrak{A}$ & comon Denominator, & $12\mathfrak{A}$ multiplied crosse in $4\mathfrak{H}$ maketh $48\mathfrak{X}$. Likewise $8\mathfrak{X}$ in $3\mathfrak{H}$ augmented, createth $24\mathfrak{X}$ so are the two proponed Fractions reduced $\frac{48\mathfrak{X}}{12\mathfrak{A}}$ being as much as $\frac{12\mathfrak{A}}{3\mathfrak{H}}$ and $\frac{24\mathfrak{X}}{12\mathfrak{A}}$ no lesse then $\frac{8\mathfrak{X}}{4\mathfrak{H}}$ and betwene themselves of equal Denomination. This Rule is vniuersall for all Fractions, of how many Sections or members so ever they consist. Now to Equations.

Of Equations.

Equation is nothing else but a certaine conference of two numbers being in value equal, and yet in multitude and Denomination different.

As we may say 1 Pound is equal to 20 shillings, or 3 Pounds equal to 12 Crownes, or $4\mathfrak{H}$ is equal to $8\mathfrak{H}$ or $3\mathfrak{A}$ is equal to $6\mathfrak{H}$. In all these their value agree, albeit the Numbers and Denominators or Characters be diuerse. Of these Equations I will speake the more particularly, for that all the Operations of *Algebra* tend to this finall end, to frame an Equation, and then therby to search the value of the Roote, or Prime, whereby the most difficult questions that may arise or be proponed, are with farre more facilitie to be resolved, than by any other Rules whatsoeuer.

Of

Of Reduction of Equations.

The Reduction which is sought in Equation, is to bring one part of the Equation, to one simple Cossicall number viz. $1x$, $1x^2$, $1x^3$, or so forth, the which is done two wayes.

First, by transposing or remouing of numbers from one part, to the other.

Then by reducing those numbers so transposed, to their least Denomination, or if they be Fractions, to an Integer.

Of transporting of numbers in Equations.

This is a Rule generall, euerie number transposed changeth his signe, as if I say $10x + 4$ are equal to $3x$, I may transfer 4 to $3x$, & say $10x$ are equal to $3x - 4$. Likewise, as $2x + 10x$ are equal to $3x - 6$, so is $2x$ equall vnto $3x - 6 - 10x$, and this for transporting of Signes sufficeth, whereby alway you may reduce one side of the Equation, to one particular Cossicall Number.

This kind of Reduction by transportation, must be so ordered, that you single by himself the greatest Character, so as the same may stand solitarie on the one side, and the lesser Characters frame the contrary part of the Equation.

Of Reduction of the parts of an Equation, to their least Denomination.

One part of the Equation being reduced by transportation of numbers, to one simple Cossicall Character. To reduce the Equation to a lesser Denomination, you shall diuide either part by some common Diuisor, the greatest you can finde.

As if $3x$ be equal to $12x - 9x$ diuiding by $3x$ I find $1x$ equall to $4x - 3$.

Sometime it shalbe requisite to take awy some number from either part of the Equation, as if I haue $6x$ Equall to $12x - 24$, deducting from either part of the Equation $6x$, there resteth 0 Equall to $6x - 24$, and therefore of necessitie $6x$ is equall to 24 , for this Rule is generall. That if you bring an Equation (by such Deduction) to a 0 on the one part, there must be some member in the other connered with the Signe Minus, the which is alwayes Equall to all the rest of that part of the Equation.

Sometimes Reduction is made by adding together all such parcels, as on the one side of the Equation haue equal Characters, as if $1x$ be Equal to $3x + 16x - 1x - 10x$. Where by adding $+16x$ to $-10x$, there resulteth $+6x$, so that I say $1x$ is equall to $3x + 6x - 1x$, and y^e same divided by $1x$ maketh $1x$ Equal to $3x + 6 - 1x$.

Reduction of Fragments which shall

happen in Equations to
Integers.

A nother kinde of Reduction there is of Fragments to whole numbers, which commeth in vse when an Equation is found betwene Fractions on the one or both parts, as if $\frac{4x + 2x}{2x}$ be Equall vnto $\frac{3x - 2x}{1x}$, by crosse

multiplication of the Denominator of the one in the Numerator of the other, I finde these two numbers produced $4x + 2x$, and $6x - 4x$. Betwene these, the like Equation remaineth, & the same first reduced by transporting of Signes, maketh $4x$ Equall to $6x - 2x - 4x$. Then by Addition of $6x$ to $-2x$, there resulteth $4x - 4x$, equall to $4x$. Again, diuiding either part of y^e Equation by $4x$, there resulteth $1x$ Equall to $1x - 1x$. And last of all, deducting $1x$ from both parts of the Equation, I find 0 equal to $1x - 2x$, and therfore of necessity, as was declared

declared before $1 \frac{1}{4}$, equall to $2 \frac{1}{4}$. Thus of that intricate fraction, you see how we haue by the former Rules produced this plaine and facile Equation. These Examples well laboured, will make all Equations familiar.

The demonstration of all these rules, hang on the third common sentence, and the fiftenth Proposition of the fifth Booke of the Elements of Geometric.

CHAP. VIII.

The Rule of Coss. or Algebra.

THis Rule is of such perfection, that it performeth not onely whatsoeuer may be done by the rule of *Proportion*, the rule of false *Positions*, the rule of *Allegation*, the rules of *Archimedes*, six quantities of *Cataym*, or of any or all other Rules that euer haue bene inuented, but also with such facilitie and sensible *Method* proceedeth in all his operations, that it may wel be accounted the *Prince* and *Gouernesse* of all other. Leauing therefore to wast words in such by branches, I will bring thee to the *Fountaine* head, whence all other Rules, as particular Channells are deriued. The Rule ensueth.

The Rule.

FOr the number sought, set downe $1 \frac{1}{4}$, then proceede in your Arithmetical workings, according to the forme and nature of the question, till you come to some Equation, the which being reduced, as is before taught, you shall by the number of that part of the Equation, which consisteth of one sole Cossical, diuide the other part of the Equation onely; if your sole Character be $\frac{1}{4}$. Or from the same extract such a Roote, as the Character of your solitarie side demonstrateth. The first Quotient or Roote thereof, shall be the vnknown or desired Number.

Example.

This Rule cannot be better explained, than by example. Admit therefore I am demaunded what number that should be, whose third and fourth parts ioyned, maketh 14. According to the rule I say, it is 1 $\frac{1}{4}$ viz. one Prime, or one Roote, as commonly Algebricians tearme it. Now the whole cunning resteth in discovering the value of this Prime or Roote.

I reason therefore thus, if the number I seeke be one Prime, then is $\frac{1}{3}$ and $\frac{1}{4}$ of a Prime added together 14, but $\frac{1}{3}$ $\frac{1}{4}$, & $\frac{1}{4}$ $\frac{1}{3}$ added, maketh $\frac{7}{12}$ $\frac{1}{4}$ therefore is $\frac{7}{12}$ $\frac{1}{4}$ equall to 14. Behold an Equation, the which because it is already simple and neede no Reduction, according to this Rule with $\frac{7}{12}$ being the number of my solitary Character, I divide 14, the other part of my Equation. Of this Division, resulteth 24, I conclude therefore 24 to be the number sought, whose third and fourth part added, should make 14. In this Equation, because the solitary Character is $\frac{1}{4}$, the quotient of the Division discovereth the number sought, but if the solitary Character had bene $\frac{1}{3}$, then should you haue extracted from your Quotient 14 his Quadrate roote, if $\frac{1}{3}$ the Cubike Roote.

Another Question.

There is a band of Souldiers armed with three sortes of weapon, Pikes, Halberdes, and Shot. The Halberds and Shot put together, are double so many as the Pikes, and the Pikes and Shot together are eight times so manie as the Halberds. And the shot by themselves alone, are in number more thā both the other weapons by 55. I demand the number of Souldiers in that band, and the number of euerie sort of weapon.

For the number of the Halberds, I put 1 $\frac{1}{4}$, then must both the other weapons together be 8 $\frac{1}{4}$, being by Supposition 8 times so many, and the Pikemen 3 $\frac{1}{4}$, for so both the
residue

restone (being 5 $\frac{1}{2}$ for the shot, added to 1 $\frac{1}{2}$ for the Halberds) become double to 3 $\frac{1}{2}$ the Halberds by Supposition, Now seeing in my question it is said, that the shot are more than both the rest by 55, I adde 1 $\frac{1}{2}$ my Halberds, to 3 $\frac{1}{2}$ my Pikes, there ariseth 4 $\frac{1}{2}$, which deducted from 5 $\frac{1}{2}$, the shot leaueth 1 $\frac{1}{2}$ equall to 55. Thus haue I an Equation. Now diuiding 55 by 1, the number of the solitarie Character, there ariseth in the Quotient againe 55. I conclude therefore 1 $\frac{1}{2}$ to be 55, and so 55 Halberdiers in that band. Then the Pikes being 3 $\frac{1}{2}$, must be 155, and the shot being 5 $\frac{1}{2}$ are 275. All these added together, make 495, thus finde I five hundred Souldiers saue five to be in the whole band. But because such Equations many times shall happen, as the solitarie Signe shall be a $\frac{1}{2}$, I will in the next Chapter shew how to extract the Quadrare Roote of sundrie sorts of Equations.

CHAP. IX.

How to extract the second Radix or Quadrare roote of any Collicall numbers, arising in any Equations.

As much as alreadie in Reduction, I haue taught so to order the Equation, that y^e Characters of the second part of the Equation shall alway be lesse than the singled Character. This is most certaine, that the extraction of the second Roote, or square Radix of Collicall Numbers, is neuer in any Arithmetical operation necessarie, saue onely of these varieties following.

To finde the Quadrare or second Radix of	{	A Number alone.
		$\frac{1}{2}$ or Rootes onely.
		$\frac{1}{2}$ + Numbers.
		Numbers - $\frac{1}{2}$

$\frac{1}{2}$ - Numbers.

These are the only fine varieties, wherein the extraction of Rootes Quadrate in these Collicall Equations are required, and for euery of these bryefe Rules shall ensue.

Rules.

1 For the first, I referre you onely to the first Booke of my Fathers, where you are taught out of any abstract or simple number or Fraction, to extract his Square *Radix*.

2 In the second, the number it self that is with the rootes coupled, is the number or *Radix* desired.

3 In the third, you shall take the moytie of the number of $\#$ or Rootes.

This moytie square, adde the same to the Number Abstract in your Equation.

To the Quadrate *Radix* of that Product, adioyne the moytie first vsed.

The Number resulting of this last Addition, is your desired *Radix*.

4 In the fourth, set downe (as before) the moytie of the $\#$ number that N. Square. That Square adde to the number Abstract, and from the Roote Quadrate of the Product, deduct the moytie first set downe. This Remaine is the desired Roote.

5 In the fifth kind there is alway two Rootes, vnlesse the moytie of the $\#$ squared, be equal to the number Abstract, for then is the moytie of the $\#$ number the *Radix* sought. But howsoeuer that fall out, you shal as before reserue the moytie of the Primes, first squaring the same, and from that Square, deducting the Abstract number. The Roote Quadrate of the Remainder, added to your reserued moytie, maketh the greater *Radix*, the same quadrate roote deducted from the moytie reserued, leaueth the lesser *Radix*.

The first and second of these Rules, being of themselves manifest, neede no farther explanation. Of the other three, particular examples shall ensue.

Example

Example of the third Rule.

$$1 \sqrt{36} 64 + 27.$$

Admit this Equation $1 \sqrt{36} 64 + 27$. The Moytie of 6 is 3, that Squared, is 9, which added to 27, maketh 36, the Roote Square of that is 6, whereto adioyning 3, the Moytie first vled, I make 9, the Radix of that Equation.

Example of the fourth Rule.

$$1 \sqrt{80} - 24$$

Here you are to Extract the Square Roote of 80 lesse 2 Primes or Rootes. The Moytie of 2 is 1, that Squared maketh 1, this added to the abstract number, maketh 81 his Roote Square is 9, from that I deduct 1 my first Moytie, so resteth 8, the Radix of that Equation.

Example of the fifth Rule.

$$1 \sqrt{14} - 33.$$

The Moytie of the number of Primes is 7, that Squared, maketh 49, from this I deduct 33, the abstract number, resteth 16, whose Roote 4 added to 7, the Moytie Fundamentall, maketh 11, the greater Roote, deduct the same 4 from 7, resteth 3 the lesser Radix. The truth whereof is thus apparant, square 11 ariseth 121, the Square which should be equal to 14 Rootes lesse 33, 14 times 11 maketh 154 the number of the Rootes, from this deduct 33, the abstract number resteth 121 your Square. In like sort, the lesser Roote 3 squared, maketh 9. Now 14 of these Rootes are 42, from which deduct 33 resteth 9 the Square. And hereby it is manifest, that both the one and the other are true Rootes of this Equation, and mo than these it is impossible to finde.

AMASIAS.

S*Tyfelins* for aide of memory in this one word *Amasias*, representeth the rules of these 3 Equations, by A or Ha, we may remember the first halfe or Moytie, the foundation of

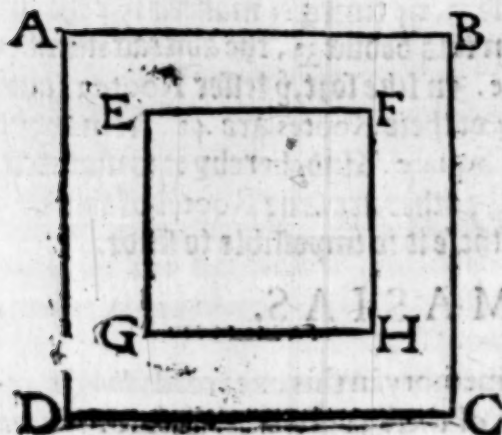
all the operatiōs, & therefore may be termed the *Moytie Fūdamētall*, *M* signifieth *Multiplicatiō* of that *Moytie* in it self, which I name *Squaring*. *A & S* Addition and *Subtractiō*, viz., in the two former *Equations*, to adde the *Square* of the *Moytie* to the abstract nūber, in the last to *Subtract* the one frō the other, *I*, signifieth the *Inuentiō* of the *Square* root of the *Product* or *Remaine*, thē *A & S* again admonisheth *Additiō* or *Subtractiō* of this root to be made to or frō the *moyty Fūdamētall*, in forme as the *Signe* of that *Moytie* declareth.

CHAP. X.

Questions concerning the office of
the Sergeant Maior.

The first Question.

THere is deliuered to the Sergeant Maior 60 Ensignes, in euery Ensigne 160 Pikes, and short weapon. The Generals pleasure is, that he shall put them into one maine Squadron, and to arme it rounde with seuen ranckes of Pikes, I demaund how many Pikes, how many Halberds, he shall vse to make the greatest Squadron, and how many ranckes shall be in that Battaile.



For resolutiō of this demaund, first I set down in Portrait the forme of the Battaile here represented, by ABCD. The Squadron of short weapō EFGH. The residue representing the 7. Ranks of Armed Pikes. Seeing therefore I haue 60 Ensignes, & in euery Ensigne 160 of Pikes and

and short weapō. I multiply 160 by 60, resulteth 9600 the number of men deliuered to be Embattelled. Now since I am demaunded the number of either weapon, and also the number of ranckes represented by the line A D or A B, I say that is 14 according to the Rule of Cofse. This multiplied in it selfe, maketh 196 the Square A B C D, the which is Equall to 9600 the number of men to be imbattelled. Thus am I come to this Equation 196 = 9600. The greatest Roote of Integers is 97, the line A D or A B Viz. the number of Ranckes.

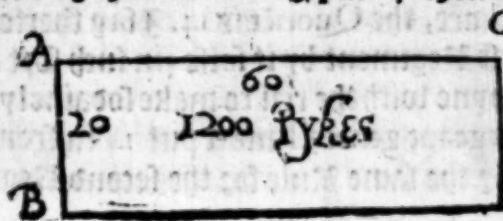
Now considering E F the side of the Squadron of short weapon is 14 lesse: (being armed round which 7 Ranckes of Pikes.) I Deduct 14 out of 97, remaineth 83 the side E F, whose Square is 6889 the number of the Short weapon, and that Deducted from 9409, the Square of 97, leaueth 2520 the number of Pikes. Thus I finde a Resolution of the demaundes as followeth.

The Nūber of Pikes. } 2520 The nūber of Short weapō. } 6889 Rākes in all. } 97 Rākes of Short weapō. } 83

The second Question.

There are 3. Regiments and in the first Regiment there are but 280. Pikes. In the second 320. In the third Regiment 600. Pikes. The Generall commaundes them to be put in Battaile of Frount triple the Flanck. I demaund how many Pikes must be in a Ranck, and how many Ranckes, and also in what fort the Sergeant Maior may most sodainly & readily imbattell them.

To resolue this Question for the number of Ranckes represented by the line A B. I put 14 then must A C, the



front being triple to the flank, be 3 $\frac{1}{4}$. These multiplied together make 3 $\frac{1}{4}$ the whole content of B C the battaile. And so stands the Equation 3 $\frac{1}{4}$ $\frac{36}{1200}$. Pikes, for so many pikes are in the 3. Regiments. And by reduction it is 1 $\frac{1}{4}$ $\frac{36}{400}$. pikes. The roote quadrate therfore being 20 is the value of one $\frac{1}{4}$. I auerre therfore the flank A B 20. and the front being triple the flank 60. and so conclude you must haue 60. pikes in ranck, and 20 ranckes to fraime your commaunded battaile. But to resolu the second part of this question concerning the most speedy & compendious way to put men in battaile. There are onely two courses: $\frac{1}{2}$ one by resoluing $\frac{1}{2}$ grosse body into Maniples or Herfes of 5. or 6. or seuen in a ranck, that may containe as many ranckes as the flank of the battaile. The other to haue those your Maniples of as many ranckes, as your front containeth souldiers.

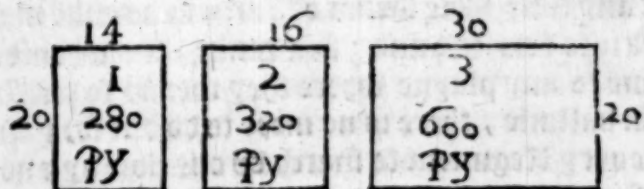
The first requireth a great number of Maniples, but these marching by one close to another are presently in battaile without any mozeado.

The second hauing fewer Maniples, is sooner brought into one body: But bycause in ioyning their front is made their flank, they must be taught the quarter turne, and so are sodainly in battaile with their front, as it ought to be: And this is in daide in these long battailes the more compendious and ready way. As by these Examples and figures ensuing shall more euidently appeare.

The first Order.

Hauing by the Rule of Algebra found that to fraime this battaile of triple proportion, the flank or number of ranckes must be 20 pikes diuiding therewith 280. the number of the first Regiment, the Quotient is 14. I say therfore to embattaile $\frac{1}{2}$ first Regiment by it selfe (in such sort as it may be ready to ioine with the rest to make sodainly that battaile) the Sergeant generall must put 14 in front and 20 in flank. By the same Rule for the second Regiment ye must

must put 16 in a ranke and 20 rankes : and the third shall haue 30 in front and 20 rankes : for the number of ranks in all must be 20, considering ye found by your Equation the flanke of your mayne battaile to be 20, and your front 60, as by these figures ensuing moze manifestly shall appeare, where you see the 3. fronts 14, 16 and 30. make 60, and so these 3. battalions of these three seuerall Regiments



marching in this maner, may sodainly conioyne and make the massie battaile of triple proportion viz. 20 in flank and 60 in front that by the Generall was commaunded.

But bycause 30 in a front is too great to march with any speede although it were in Champion, and that by reason of straights or abrupt passages, ye should be many times forced to breake these bodies in your march. It is requisite to reduce euery of these bodies into Maniples of five, or six or 7. in a ranke : The first therefore hauing 14 in front 3



would reduce into two Herdes or lieues of seue in a rank: The second Battallione into 3 Maniples, the two first of

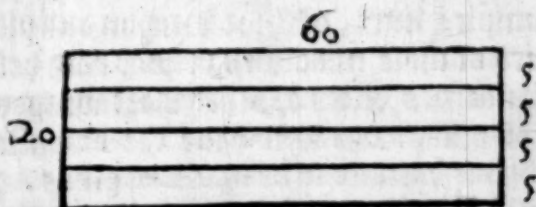
5 in a ranke and the third of 6. and the pikes of the third Regiment being 30 in front, ye may resolve either into 5 files of 6 in a ranke, or into 6 files of five in a ranke at your pleasure, as by the figures preceding more evidently you may conceive.

Thus if every Regiment be drawne out in Maniples of 5, 6, or 7 the most in a ranke, they may easily and speedily march away in all grounds, or if necessitie should enforce at any time, those files of Seven in a ranke may be resolved into two of 4 and 3 in a ranke, and whensoever they come to any playne where they meane to put themselves in battaile, there is no more to do but for the Maniples of every Regiment to march up one close by another till the fronts be ioyned and so make the three particular Battallions, and then those battallions either by a like direct march, or if neede be by a counter march well directed by the Corporalles, to unite themselves, which by this good order and direction first given is done suddenly and without any confusion in the tenth part of the time that otherwise it would be. But if your pikes should not be sorted in Regiments, but deliuered you in grosse by the Generall with commaundement speedely to embattaile them, then would I advise the Sergeant Generall to take the other course as the more speedy and compendious.

The second Order.

These 1200 pikes being not sorted into Regiments, considering by the rule of Colle I found the front 60 & flank 20 I will resolve the flanke into 4 files of 5 in a ranke & 60 ranks. Which may very conveniently & speedily march in all grounds, & whensoever ye are commanded to make your battaile, lead the first Horse to the ground where your battaile shall stand, placing the flanke of your Maniple where you meane the front of your battaile shall be, & then cause your Corporals to bring in the other Maniples marching close
up

bp by yours , till their frōts ioyne matching their rankes equally, the which considering there is but 4 Maniples is done sodainly, & thē haue ye no moze to do but the quarter turne to make their flanke their front , & your battaile is perfectly formed and ready to ioyne with their enemy as by this figure ensuing will the better appeare.



I hold it needelesse in these things of facilitie to spend moze wordes albeit I know some Italians haue framed bookes of Tables onely for making of battailes of fronts double to their flankes , so that by this Rule of Colles if I should make like Tables for treble, quadriple, sesquialter sesquiterce, and for all such varietie of proportions of battailes as in y field shal sometimes be vsed, it would amount to a volume as big as fīue Bibles, and yet by this one easie and facile rule dispatched with moze facilitie, & also moze readily, then it is almost possible to turne the booke, and by Suruey of the Tables to finde the number : whereas those Tables, (although they were as great as twenty Bibles) were not able to containe meanes sufficient for all varietie of formes and numbers that this rule extendeth vnto. And to speake plainly a truth, he deserues not to beare the office of a Sergeant General, that is not able of himselfe without aide of any mans Tables (which may happily be miscast or misprinted,) that is not able of himself I say to correct & reforme such Tables , or without such directions

of other men to discharge his office : which in great numbers is vtterly impossible without art to be perfozmed, but so slowly & vnozderly as shall make the officer ridiculous euen to the common souldier.

But if your battaile be not massie of pikes but of short weapons empalled with certaine rankes of pikes, then must you order your Maniples accordingly, causing your first and last Maniple to be entierly pikes, and the other middle Maniples mixt, of short weapon and pikes, placing in euery of those middle Maniples both befoze & behind your halberdes, billes or other short weapons so many rankes of pikes as ye will haue the empallement of the sides of your battaile to be massie of pikes. But this common discretion in practise will teach, and therfoze superfluous in so playne a matter to spend moze woordes.

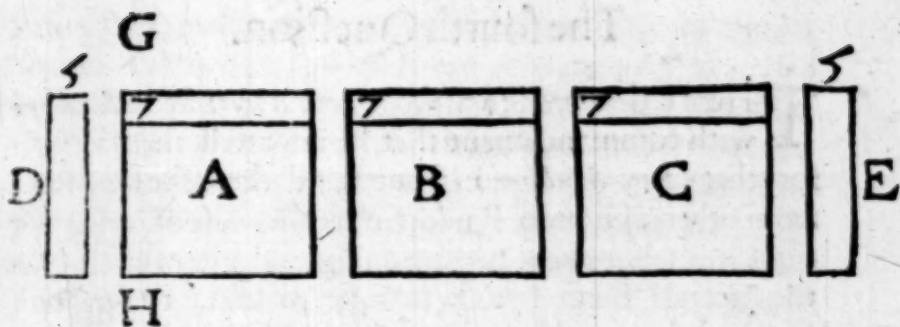
The third Question.

THE high *Marshall* commaundeth that the Army shall be diuided into 3 like square Battailes, euery Battaile to be Armed in the front with seuen Rankes of Pikes, and that these battailes making one front vpon the Enemy to be empaled on either side with a sleeue of Pikes of fise in a rank. This order being prescribed, he deliuereth the *Sergeant Maior*, 18000 *Souldiours* pikes and short weapon. commaunding that the *Squadrons* be made as great as possible may be of those men. It is demaunded how many in euery ranke of the *Battallions*, and in what sort the *Sergeant Maior* shall shift his weapons: how many pikes for the sleeves, and how many of short weapons and pikes in euery Battallion seuerally.

To resolute this Question, first I put the Marshals order in figure, A B C representing the 3 Battailes armed in the front with seuen rankes of Pikes: D and E the Sleeues fise in a Ranke.

Now

STRATIOTICOS.



Now because I know not G H the side of the Battaille
or length of the flæues, I suppose that 1 $\frac{1}{4}$, the which incre-
sed by 5 maketh 5 $\frac{1}{4}$ for one flæue, that doubled maketh
10 $\frac{1}{4}$ for the 2 flæues, then square 1 $\frac{1}{4}$ so haue I 1 $\frac{1}{4}$ the
quantitie of one battaille, and so consequently 3 $\frac{1}{4}$ for the
3 Battailles. Which adioyned to 10 $\frac{1}{4}$ the 2 flæues maketh
3 $\frac{1}{4}$ + 10 $\frac{1}{4}$ for Battailles and flæues. But that should be
18000, for so many men were deliuered to make the Bat-
talls. Behold therefore the Equation 3 $\frac{1}{4}$ + 10 $\frac{1}{4}$ \approx
18000, which reduced maketh 1 $\frac{1}{4}$ + $\frac{1}{4}$ \approx 6000, & so con-
sequently 11 $\frac{1}{4}$ \approx 6000 — $\frac{1}{4}$ $\frac{1}{4}$. The value of this Roote by
the fourth Rule is found to be 75 and certaine Fractions
which alwayes in these Militarie questions may be omit-
ted. I conclude therefore euerie battaille must haue 75 in a
ranke, and that multiplied by 5 maketh 375 the number
of Pikes in either flæue. And because the Battailles are ar-
med in the front with 7 rankes of Pikes, I multiply 7 in
75, so haue I 525, & number of Pikes in euery Squadron,
and that deducted from 5625 the Square of 75, resteth 5100
the number of the Short weapon in euery Squadron. Thus
standeth euerie demand resolued as followeth.

Pykes in either } 375. } Pikes in ene- } 525. } Short weapō in }
Sloene. } ry Squadro. } euery Squadro } 5625.

The number of Rankes }
in euery Squadron. } 75.

It is

STRATIOTICOS.

The fourth Question.

THere is deliuered to the *Sargeant Maior* 8500 *Souldiers* with commandement that he imbattell them in such sort that euery *Souldier* in front stand three foote distant from other, and euery Ranke from other 7. foot, obseruing this Ordinaunce he is commaunded to frame of these men the greatest Battayle that may be to make the ground square. I demaund how many in a Ranke, and how many Ranks in that battayle.

For the number of Ranks I suppose 1 $\frac{1}{2}$ then must the number of Souldiers in a Ranke be $\frac{2}{3}$ $\frac{1}{2}$ these multiplied together make $\frac{2}{3}$ $\frac{1}{2}$ Equal to 8500 the whole nuber, which Equation reduced standeth thus, 1 $\frac{1}{2}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{1}{2}$ $\frac{2}{3}$ $\frac{1}{2}$ and so by the first Rule of Equations. I finde the Roote 60 with a Fraction which heere neglected I affirme 60 Ranks in that Battayle, which multiplied by 7 and diuided by 3 maketh 140 the number of Souldiours in euery Ranke.

The number of } 60 The number of Souldiers } 140.
Ranks. in euery Ranke.

How by this Art of *Algebra* or Rule of Cosse as the *Italians* terme it. The *Sergeant Maior* or *Sergeant generall* may readily imbattel his *Souldiers* in what order soeuer it shall please the Generall or high Marshall to command.

Infinite are the formes of imbattelling, some Circular, as appeareth by *Julius Cesar* in his *Commentaries* when he declareth how his Armie *Globo Facto*, defended themselves, some Triangular, as in the same *Commentaries* may be seene where his Souldiers being enuironed of their enemies *Cunco facto erupere*: Some ranged in forme of *Lunula*, towherein the Turke especially delighteth, reposing a certaine superstitious confidence in the figure. But who,
soeuer

foeuer shall wel consider howe impossible it is for any of these or like formes to March and mayntaine their aray, as Souldiours in our age are trayned, shalbe compelled to confesse the Squadron and Battels made and framed of Squadrons, onely in these our warres able to be vsed. And no doubt if the Turkish Army march & mayntaine that forme, it must be by deuiding the same into many Squadrons, placing them in such Lunular forme, and then euery of those Squadrons by the direction of discrete Colonels marching united, may mayntayne their aray, and still represent that their Lunular Figure. The like I suppose of the Romanes, whose Legions were altogether composed of Square Cohorts. Being therefore the best and surest, or rather the onely kinds of imbattelling as well to March as to Fight, is Square or composed of Squares, it shall be onely needfull for the Sergeant General to set downe in Figure the manner of imbattelling by the Generall commanded, as I haue in the former questions already shewed, and then accordingly to proceede in his Operations, allowing for euery Squadron $1\frac{1}{4}$ and for euery number of Souldiers answering to the side of a Battalion in impalement or otherwise, onely allowing $1\frac{1}{4}$ so proceeding till he come to the Equation.

Finally, by the Art before taught searching out the value or number of the $\frac{1}{4}$ and $1\frac{1}{4}$, he hath the number of Souldiers in euery Battalion, and the number of Souldiers in euery ranke, together with the numbers of Souldiours and Rankes in euery impalement, wings &c. as by the former questions and their operations may evidently appeare. And by this Art the Sergeant General shalbe able suddainely, how great soeuer the multitude be, to change their forme of imbattelling into as many sundrie orders as shall be enioyned, or in respect of the Enemy, or the place, shalbe found conuenient.

CHAP. XI.

Certaine Questions touching the Office
of the high Marshal and Campe Master.

Although the forme of *Camps* may be altered according to the diuersitie of *Situations*, in respect of riuers, or woods that do adioyne thereto, yet for lodging both *Horsemen* and *Footemen* commodiously, readily and without confusion, there is none better than the *Square*. It behoueth therefore those officers to vnderstand first what quantitie of ground sufficeth for the lodging and encamping of some certaine *Regiment* of *Horsemen* and *Footemen*, which knowne by the *Rules* ensuing, he shalbe able to extend the same to al numbers, and to know readily vpon the view of any ground what number it is able to receiue both of *Footemen* and Horse, and accordingly to giue order to inferiour Officers in what sort they shall proceed to diuide their ground for euerie *Regiment*.

The first Question.

Admit I finde by experience that 3000 footemen may commodiously be encamped in a plat of ground 300 pace *Square*. I demand how many pace the ground should be square that shall receiue 10000. Footemen.

To resolue this Question, I say the number of pace demanded is $1\frac{1}{4}$ the *Square* therof is $1\frac{1}{4}$ of paces, the which is able to receiue the 10000. When say I thus by the Rule of Proportion 10000 giueth $1\frac{1}{4}$ of paces, what yeldeth 3000, by Multiplication and Diuision, I finde the fourth Proportional number $\frac{3}{4}$ $1\frac{1}{4}$ whereby it appeareth, that in the Camp of 3000 there is $\frac{3}{4}$ $1\frac{1}{4}$ of paces, but in that Campe by supposition there is 90000 paces, so, so much is

300 multiplied in it selfe. Behold therefore your Equation.

$3\frac{1}{4} \text{ } \text{€} 90000 \text{ Paces.}$

The Value of the Route found by the first Rule of Equations is betwene 549 and 550: so many paces therefore ought the ground to be Square that shall receiue 10000 men.

The second Question.

I Finde by experience that 1000 *Horsemen* will demaund as much ground to encampe on as 10000 *Footemen*, I finde also by experience that 550 pace Square of ground will suffice to receiue either of them in one maine *Squadro Campe*, but my desire is to diuide either of them into 3 *Regiments*, and to lodge them seuerally in 3 square *Campes*. I demaund how many pace Square euery of those *Campes* must be.

For the number sought I set downe $1\frac{1}{4}$ that Squared maketh $1\frac{1}{4}$ of paces, the Superficial content of one of the 3 *Camps*. Therefore shall the three *Camps* be $3\frac{1}{4}$ of paces, but those three were contained in 302500 paces, for so much is the content Superficial of the Campe of 550 pace Square. Behold therefore your Equation.

The Equation.

$3\frac{1}{4} \text{ } \text{€} 302500 \left\{ \text{which reduced makes} \right\} 1\frac{1}{4} \text{ } \text{€} 100833\frac{1}{3} \text{ paces.}$

The value of the *Prime* searched as before is taught, is 317 pace, and so much Square ought euery one of the three Foote *Campes* and Horse *Campes* to be, for the convenient receite of such *Regiments*.

The third Question.

Experience teacheth, that to encampe 6000 *Footemen* and 600 *Horse*, in such commodious maner that al the

streetes may be of reasonable breadth, the Market place and place of assembly of sufficient Capacity, roome sufficient for the Munition, with a Ring and trench meete to receiue the *Sentinels* and Souldiers for defence, together with the Carriages to impale the same Campe. To performe these dueties commodiously, it is requisite the Campe should be 32 score pace Square. But there is deliuered by the Generall 30000 footemen, and 3000 Horse: I demaund what scope of ground the Lord high Marshall or Campe Master should appoint to receiue this company lodging them as commodiously as the other.

For the number of score or paces in the side of this new Campe whose quantitie is desired according to the Rule of Colles, I set downe $1\frac{1}{4}$ and because the Horsemen and Footemen, in either Campe are proportionally sorted, I adiogne the numbers of Horsemen & Footemen together, which make 33000 and seeing the side of this new Campe is $1\frac{1}{4}$ of paces, the Superficial Capacitie must be $1\frac{1}{4}$ of paces. I say therfore if 33000. Souldiers, require $1\frac{1}{4}$ paces to encampe, what shall 6600 the number of Souldiers in the lesse Campe: There ariseth $\frac{1}{4}$ paces, but by Supposition that little Campe contained 40960 paces, for so many are in 32 score Square.

Behold therefore the Equation.

The Equation.

$\frac{1}{2}$ 11 36 409600 paces } *This Reduced* } $\frac{1}{2}$ 11 36 2048000 paces
maketh }

And so the value of the *Prime* by *Extraction* of the *Roote*, as is taught in the Chapter of *Equations*, falleth out betwene 1431 and 1432 paces. So is the side of the new Campe 71 score 12 paces.

But if the Horsemen and Footemen had not bene Proportionally sorted to the numbers in your Little Campe: then is the readiest and surest way severally, by the Art thewed

shewed in the first and second Question, to cast how much ground either Horse Campe and Foote Campe will require, allowing convenient groundplats for Market place, & places of assembly, with Streets to part the said Campes, and also space sufficient for the Ring of the Camp, proportionally, according to the increase of the numbers of souldiers to be encamped. Finally, adding together the superficial content of those Campes, places of assembly, and Streets &c. there resulteth the superficial quantitie of the whole Campe, which reduced into paces, the Roote Quadrate thereof is the number of paces contained in the side of that Campe. And hereof I neede adioyne no example, considering there is nothing else in this Operation but a reiteration of the former workings severally for either Campe, the places of assembly, the Streets, &c. transferring by the Rule of Proportion the measures from one Campe proportionally to another.

The fourth Question.

HOW the high Marshall or Campe master whatsoeuer number of Horsemen and Footemen shalbe deliuered vnto him, may redily coniecture what quantity of ground will suffice strongly and commodiously to encampe them, and how much he ought to allow to either Horsecampe or foote Campe severally.

To resolute this Question, it is convenient to know what quantitie of ground is to be allowed to a Horseman, and how much to a Footeman, & this is only by experience to be learned, and among the experimented souldiers of diuers ages and Nations, I finde diuersitie of Opinions. Monsieur Lange alloweth to euerie footema 90 Quadrate fote of earth, and to euerie man of Armes 900, & to euerie Estradiote and light Horseman 800. Others following the Romanes, assigne to euerie Footeman a Quadrate plat of

ground sixe foote broad, and tenne foote long, and to euery Horseman one with another the lodging of thzee footmen. The Romaines sought alwayes to encamp strongly, pressing nigh together, not regarding pleasure or commoditie. But as their Proportion is somewhat too straight for Souldiorie trayned in this our age, whiche can neyther away with the annoyances, ne yet with the hard dyet, which was familiar to the Romans: so iudge I the former Proportion of Monsieur Lange, ouermuche to dilate and enlarge the Camp, & therefore considering the streetes that deuide the Horse and foote Campe, must be large, and also betweene euery Regiment in either Camp, there must be couenient wayes and passages, neither by ouermuche delating the Campe to make it weake, ne yet by ouer streightning of the Lodgings and passages, to pester the Souldiorie, I hold it conuenient to allow to euery Footman, 80 square foote of earth, and to euery Horseman 400. and for the places of Assembly, the Market place, the Butcherie, the Victuallers, and place to receiue the Munition & Ordinance, with the Pioners, and other Mechanical artificers as much moze as both Campes amount vnto, so will there fall out, after the Ring of the Campe is described of conuenient largenesse, and all streetes and passages in proportion answerable with due place to receiue the Colonels, Captaines, and Officers of euery Bande particularly, that then the Lodgings of a Footeman shall not amount vnto aboue 50 foote, and euery Horseman one with another 250. To resolve therefore this Question, you shall multiply the number of footmen by 80, for the superficial content of the Footcamp, and the number of Horsemen by 400 for the Horse camp, the Products adde together, and double the resulting summe: the Roote Quadrate of this last produced number diuided by 3, deliuereth in the Quotient howe many Pace square the Campe shall be, which may both strongly and commodiously lodge your proposed Armie. And the Rootes

Rootes Quadrate of the contentes superficiall of either Camp diuided by three, doth also deliuer how many Pace the side of either Camp shall be.

Example.

Admit I haue 30000 Footemen, and 6000 Horse to be encamped, I multiplie 30000 by 80, ariseth 2400000. I augment also 6000 by 400, ariseth likewise 2400000, these ioyned, make 4800000, which doubled, presenteth 9600000, the Quadrate Rote hereof is 3093, which parted by three byingeth in the Quotient 1031. So many Pace shall the side of that Square Camp be, which shall lodge the thirtie thousand footemen, and sixe thousand Horse. If the Enemie be at hand, I would haue alwayes the Ring and Trench of the Camp within, but if the Enemie be not doubted, they may be made without this proportion of Camp, whereby the Streets and lodgings may be enlarged.

The more ample handling of this office referred to another Treatise.

I Might here adioyne sundry formes and orders of Encamping, vsed by sundry Nations, and thereupon frame a great number of *Arithmeticall Questions*, but I reserue the more ample handling of this matter, to another Treatise of *Fortification* of Townes and Campes, wherein I will declare how by the *Topographicall Instrument* described in my *Pantometria*, the High Marshall sodainely may set downe the Ring of the Camp, that shall receiue any Armie that shall by the *Generall* be committed vnto him, assigning to euery Regiment his *Quarter*, and how with like celeritie the *Camp Master* or *Prouostes* of euery Regiment shall distribute their *Bandes*, and the *Harbinger* of euerie Bande his seuerall Lodging, so that the Armie shall speede-

ly, strongly, and commodiously be lodged, without confusion or disorder. And for this present Treatise, being onely *Arithmetically*, these few Questions may suffice to giue some light to the *Ingenuous Souldiour*, to search further how this *Art* may stand him in stead, for exact ready dispatch in his *Militarie Actions*.

CHAP. XII.

Certaine Questions Arithmetically,
concerning the Office of the Master
of the Ordinance.

IF a Falcon of three inches Bullet weigh 500 Pounds, I demaunde how much a Canon of eight inches will weigh, that is able to receiue his proportionall charge to that Falcon.

This Question by the simple Rule of Proportion, can not be answered, for as much as weight is peculiarly appertaining neither to lines nor Superficies, but onely vnto Solide bodies. Being therfore as it is by Euclid demonstrate, and in my Pantometria I haue already taught, that Spheres, and all other like & vniforme bodies, be in Triple the proportion of their Diameters, you shall multiply either Diameter or height of the Bullets Cubically, and with those Cubicall numbers, worke according to the Rule of Porportion, as by the Example ensuing more playnely shall appeare.

Example.

The Cube of 3 is 27, the Cube of 8 is 512. Now by the Rule of proportion say 27 yeldeth 512, what giueth 500 the weight of the Falcon, the fourth Proportionall number amounteth vnto 9481. The Cannon therefore that shall be able to carrie a Porportionall charge to the Falcon, must haue 9481 pounds of mettall, but because commonly those
greater

greater sort of peeces are not so massie of mettall as in deede they ought to be, the Gunners haue it for a generall Rule, that in all peeces aboue six inches of Bore, they must abate $\frac{1}{4}$ of their ordinarie charges.

The second Question.

If a Falconet of three inches the Bullet, require three pound of Powder for his charge, I demaunde how much of like Powder will charge a Cannon of eight inches Bullet.

In this as in the former, the Rule of Proportion plainly vsed sayleth, but working with the Numbers resulting by Cubicall Multiplication, the Quotient will shew the desired waight of Powder.

Example.

I multiplie 512 the Cube of 8 by 3 the charge of the Falcon, there ariseth 1536 , which I diuide by 27 , the Cube of 3 the Diameter of the Falcons Bullet, so haue I in the Quotient $59\frac{4}{27}$: so many pound of Powder is $\frac{1}{2}$ due charge of your Cannon, but if by the Rule last taught, you finde that the Cannon hath not his proportionall masse of mettall, you may accoꝝding to the vsuall Rule of Gunners, abate $\frac{1}{4}$, so will there remaine 42 Pounds, and somewhat moze of Powder for your Canons charge.

In this sort by the Charge of any one peece of Ordinance knowne, you may finde out the certaine Charge of all others.

The third Question.

If a Falcon that carrieth poynt blancke 150 pafe, at vtmost randon range 1300 pases, I demaunde how farre a Culuering at his vtmost randon will reach, that at poynt blancke, or leuell, rangeth 250 pafe.

I cannot here, but note the grosse errour of Girolamo Ruscelli Nouarese, who in his Booke entituled *Militia Moderna*, intreating of great Ordnance, supposeth, that in all sortes of Peeces, the difference of their vtmost Ranges, should be in proportion answerable to the waight of their Bullets, and charges of Pouder, and thereupon deliuereth a Rule by Multiplication and Diuision (the vtmost Range of any one peece knownen) to finde the same in all other.

In the same Chapter also, he publisheth another Errour, supposing that in one, and the selfesame peece of Ordnance discharged with seuerall charges or quantities of one kind of Pouder, that the ranges of the Bullets should alway be Proportionall to the quantities of their charges, or waight of the Pouder wherewith they are charged.

In both these cases, the diuersitie of the ranges is compounded of sundry Proportions, as in a peculiar Treatise for that purpose I will declare, and can not by the Rule of Proportion onely be discovered. But in this Question, the Rule of Proportion precisely serueth, because the Point-blanke and Vtmost ranges in all Peeces whatsoeuer are in deede Proportionall. I multiplie therefore 250, by 1300, there ariseth 325000, which diuided by 150, yeldeth for the fourth proportional 2166 $\frac{2}{3}$, so many Paces shall the Culuerine reach at his vtmost Randon.

And thus by observations vled in one Peece, by this Art of Proportion, a man may discover the force of all other.

Other matters in the office of the Master of the Artillerie to be considered.

I might here adioyne many mo *Questions*, touching the waight, quantitie, and number of Pouder, Shot, and fundrie sortes of Ordnance to be vsed at a *Batterie*: how to mount all sortes of Peeces, to strike any marke at *Randon*:

don: the number of Carriages, of Ladles, Rammers, Scourers, Waddes, Tampions, Cartages, Matches, Barrels, or Lastes of Powder &c. Also, the number of Gunners, Assistantes, Pioners, Smithes, Carpenters, and other *Artificers*, to attend on the *Artillerie*, what number of Horses and Oxen to drawe them, the waight of all sortes of Peeces, the charges of them, their Wheelles and Carriages. Of those and many other things to the office of the Master of the *Ordinance* appertaining, as well for the *Field* and *Camp*, *Towne* or *Forte*, as also for seruice on the Seas, I might propone an infinite number of Questions *Arithmeticall*: but hauing in a peculiar Treatise of *Artillerie* prepared to handle at large all these, and many more rare *Experiments* of great Ordinance, I leaue further in this place to wade in that Office.

CHAP. XIII.

Questions Arithmeticall, concerning
the Office of the Treasurer, and Auditor, the
Master of the Victuals, and Captaine
of the Pioners.

The first Question.

If 17000 pounde be able to paye 5000 Souldiers for nine weekes, I demaunde how much treasure will suffice to pay 30000 Souldiers for a yeare.

This Question, as it standeth vpon a double consideration of men and time, so is it also to be double wrought by the Rule of Proportion, saying thus, if 5000 souldiers require 17000, what will 30000 for like time require. By Multiplication and Diuision I find the fourth Proportionall 102000 Poundes. The agayne I say, if nine Weekes require 102000 Poundes, what shal 52 Weekes, for so many Weekes are there in a yeare. The fourth Proportion-

nall is, 589333 Poundes and a poble, so much Treasure will pay 30000. Souldiers for a yeare.

The second Question.

Admit there be of a Praye or Bootie taken 300 Pounds sterling to be distributed to a Bande of 150. footemen, wherein there is 20 Souldiers wanting of a Bande cōplet: I demaunde how much the Captaine and euery seuerall Officer and Souldier of the Bande should haue for their part or share ratably made according to true auncient Discipline Militaire?

This Question, albeit it seeme facile and easie, yet is it not possible for the best Auditor in Englad by Counters to finde out or set downe their shares or parts exactly, as by Arithmeticke it may be done: But for Resolution of this Question, it is first necessarie to know the Princes List or Rate of payes for such a complet Band Journall or Annuall: And for because there are 20 Souldiers in defect, ye shall from the Totall of the Journall charge, abate 20 Souldiers paye and twentie dead payes more to be checked in respect of that defect, the Remaine is the Journall charge or due of that Band: This Remaine ye shall reserue for the Diuisor generall. Then multiplie the Journall pay of the Captaine, Officer or Souldier (whose share ye desire to know) by the 300 Poundes sterling diuisible among the Band, and the product diuided by the former reserued Diuisor generall, discouereth in the quotient and his appendant fraction the true part exactly to that officer or Souldier due, as by the operations ensuing better shall be conceiued.

Example.

First I set downe the List of a foote Band of 150 Souldiers signed and established in the gouernement of the Earle of Leicester, as ensueth.

The

The Journall Rates of a Bande
of 150 footemen complete.

	Per diem.	
	£	ſ
The Captaine.	6	0
The Lieutenant.	3	0
The Ensigne.	1	6
Two Sergeants.	2	0
Two Drummers.	2	0
One Surgeon.	1	0
Totall Officers.	15	6

135. Souldiers and 15 dead }
payes at 8 d. per diem le pe. } £ 5 0 0

The summe Totall of the }
whole Band complet. } £ 5 15 6

This 5 £, 15 ſ, 6 d, resolved into pēce maketh 1386 pence, from which I abate 176 pence for 20 souldiers, and 2 dead payes defect &c. checked, the Remaine being 1210 d, is the true Journall charge of that band checked by the true discipline of Muster, and this 1210 is my Divisor generall.

Then doe I multiplie for the Captaines portion 6 ſ, reduced into pence by 300, the summe to be distributed, & the product diuided by 1210 the Divisor generall yeldeth in the quotient 17 $\frac{1070}{121}$ l, which reduced in coyne maketh 17 £, 17 ſ, 0 $\frac{16}{121}$ of a peny.

Likewise for a priuate souldiers pay I multiplie 8. by 300. and the product being 2400 I diuide by 1210 the Divisor generall, so haue I in quotient $\frac{199}{121}$ pounds, which reduced is 1 £, 19 ſ, 8 $\frac{4}{121}$ pence.

And by like supputatiō I finde the exact portions of every other officer, as here vnder is particularly set downe.

	P,	ſ,	d,
The Captaine. —————	17	17	0 $\frac{36}{121}$
13 Dead payes diuisible &c. 25 — 15 — 8 $\frac{52}{121}$	25	15	8 $\frac{52}{121}$
The Lieutenant. —————	8	18	6 $\frac{18}{121}$
The Ensigne. —————	4	9	3 $\frac{9}{121}$
A Sergeant. —————	2	19	6 $\frac{6}{121}$
A Surgeon. —————	2	19	6 $\frac{6}{121}$
A Drumme. —————	2	19	6 $\frac{6}{121}$
A privat Souldier. —————	1	19	8 $\frac{4}{121}$

The Corporals & Gentlemen of the Band are to haue like share & portion to the Sergeant of a band: but the ouerplus aboue the priuate souldiers share, is to be allowed the out of the dead payes, and the ouerplus of those dead payes at the Captaines discretion, according to the Militare Ordinances established by the Earle of Leicester, and States Generall, as hereafter in the third booke of Militare laws and duties more at large shalbe declared.

The third Question.

If 1200 Quarter of Corne suffice 4000 Souldiers for 9 Weekes, how much ought to be provided to serue 25000 Souldiours for 40 Weekes.

Double working by the Golden Rule resolueth this Question euen as the former. I say therefore, if 4000 Souldiours require 1200 Quarters of Wheate, what shall 25000: working by the Rule of three, I finde 7500 Quarters. Againe I if say, nine Weekes demaunde 7500 Quar-

Quarters, how much will 40 weekes. The fourth Proportionall resulting by Multiplication and Diuision, is $33333\frac{1}{3}$. I conclude therefore that to maintaine an Army of 25000 Souldiers 40. weekes, the master of the Victuals must prouide $33333\frac{1}{3}$ quarters of Wheate: in like sort may be forecast for all other Prouision.

The third Question.

If 500 Pioners can in tenne houres cast vp 400 rodde of trench, I demaund how many labourers will be able with a like trench in three houres, to intrench a Campe of 2300 rodde compasse.

This Question hath a farther difficultie than the other two last past, because in the second operation the Rule of Proportion must be inuerfed, and wrought backward, as by the Example shall moze plainely appeare.

Example.

First I say, if 400 rodde of Trench require 500 souldiers, what shall 2300 rodde. Here according to the plaine Rule of three, I multiplie the third by the second, so haue I 1150000, which diuided by the first, deliuereth in the Quotient 2825 Souldiers: then must I say for the second operation, if in tenne houres 2825 Souldiers be able to discharge it, how many shall performe the same in three houres? Now if you should worke by the Rule of Proportion direct, you should finde a lesser number of souldiers, because three houres is lesse than tenne houres, but because reason teacheth me, that the lesser is the time wherein the Trench must be made, the moze Labourers I ought to haue, I must inuerse the operation, multiplying 10 the first number by 2825 the second, and diuide by 3 the

third number, so haue 3 in the Quotient $9416\frac{2}{3}$ so manie Pioners must 3 haue to intrench that Campe in three houres.

How manie wayes the Rule of Proportion direct, and inuerfed, serueth the tourne in these forenamed Offices,

I thinke it not necessarie in these matters to propone any more Questions, seing the ingenious Arithmetician by consideration of these may deuise infinite others, as well in the Treasurers Office to supputate the weekly, monthly, and yearely charge of euerie Band of Horsemen or Footemen, how different so euer their payes be, as also the charge of Ordinance, Powder, Cariages, and all other sortes of Munition, and Instruments meete to follow any Army.

The Master of the Pioners likewise, and Master of the Victuals shall neuer be able without this Art to put readily in execution the commandements of their superiour Magistrates: and the more perfection they haue in this Science, the more speedily and with lesse staggering shall they be able to discharge their duetie, and shal not neede to rely vpon the direction of any servant or other hired person, as many do, that being appointed in Office, wher they should direct others, are fain first to hire some one or other to direct themselves. Or else that worse is, following their owne vnskillfull bzaine, shame themselves & ruinate their Souldiers. To auoid therfore such inconuenience, I would aduise euery Gentleman that will addict himselfe to the wars, to make this Art first familiar vnto him, the which he shall finde not onely in this Campe and field seruices to enable him: but also in matters of Fortification it is so requisite, that it may by no meanes be spared: As in an especial Treatise that I haue begun of those matters, I wil
make

make apparant. And this woꝝk being meere Arithmetical, may not well be interlaced, the same crauing aid also of Instruments and Demonstrations Geometricall.

Touching the Art of Algebra how much requisite for a Souldiour.

This Art consisting of infinite varietie of Equations in numbers Cossicall, & also of numbers Radicall, Rational & Irrationall, would require a seuerall Treatise of great quantitie sufficiently to handle the same, but because the subtile Demonstrations of the most curious Cossicall Equations, & likewise the requisite Operations in surde numbers, are rather for exercise of Inuention, & to shew perfection of Science, than for any necessitie to be vsed in matters Politike, or Mechanical, I haue here onely briefly deliuered so much therof, as in a Souldier may not be missed: Such a Souldier I say, as shal in al Militare causes be able to see with his owne Eyes, heare with his owne Eares, and discern with his owne Wits, & not resemble such as run wth others Legs, & flie with others Wings: such I meane, as if euery Bird should pull her owne feather, like Esops Daw might dance naked. These are no curious Inuentions, but plain, easie, requisite Rules y^e here I haue deliuered: The necessary vse of the in my other Treatise of Artillery, Architecture, Nauticall, & Militare, shal more plainly appeare, meaning neuerthelesse (God sparing life & Liberty frō my long troubles) to satisfie also y^e expectation of such as fly an higher Gate, & wil not stop at cōmon way: hauing in y^e latter part of my Pātometria & in diuers parts of my booke entituled Alæ seu Scalæ Mathematicæ, alreby deliuered sundry Inuentions & Demōstrations, neuer yet disclosed by any, which if please the in y^e meane time, they may peruse. And to such as delight in matter seruiceable for y^e State in causes

Militare (the same being indēde the Art and Profession onely or chiefly convenient for the Nobilitie, and Gentlemen of this land) I hope this Introduction shall not be vnwelcome: meaning, as I see the same gratefully accepted, hereafter to impart the rest, leauing at this time farther to wade in the large Sea of Algebra and numbers Cossicall.

ARDVA QVAE PVLCHRA.



The third Booke.

CHAP. I.

The conditions and qualities that ought
to be in a priuate Souldier.



As much as the profession of a Souldier is of all other the most painefull, it is requisite that he be of a strong composition of bodie to abide both heate and cold, hunger and thirst, travell and watching, and that when he enter into this course of life, he put on a Resolution to abide all kind of hardnesse.

Item, that they be chosen generally from 19 yeares of age till 45.

Also that he be fitted with weapon according to his strength. If he be a tall strong man, then is he fit (if he be in courage answerable) to vse a Pike; If little and nimble, let him practise to be a good Shot: The meane may vse the Halbard and blacke Bill.

And rather in choise of armed Pikemen (which is indeed the force of the field, and the most honorable kind of weapon) I like the Spanish discipline, which haue that weapon in so great reputation, as they seldome commit them but to Gentlemen, yea to the most noble. For a Princes sonne at his first entrance into Armes, thinkes it honorable for him to traile a Pike. And indeede the courage and reputation of the person (resolving to abide when it cometh to the execution) is more to be regarded then the greatnes of his limbes: albeist, where Courage and Stature are conioyned, it is the better.

I would also wish some such customes practised among our Nations, as are obserued among the Spaniards: one is, when any new souldier is entred into their bands, he is presently receiued into some one fellowship among them called Camerades, where the old Souldiers instruct him of his duety, and if he erre or commit any faults, they friendly reprove him, and admonish him: if he be bare in apparell, they furnish him of their owne purses, because he should not be a dishonour to their Natio. Again, among the Spaniards in a yeare ye shall scarcely heare of a quarrell, for they vtterly detest quarrellers, and loue modestie: And if any quarrell happen, their companions endeouour by all meanes to make them friends, and yet in such cases (as it is conuenient for them to vse Armes) they acquite themselues honozably, and whensoever any valiant action is done by any one, all the rest extoll it, and seldome or neuer suppress it, or enuiously seeke to disgrace it, whereas (among vs) the quite contrarie is commonly practised. Again among them, if any souldier happen to be hurt, the rest with their purses contribute to his helpe, and of all other nations there is none more obedient to their officers, for you shall see a Sergeant of a private band among them to be obeyed of the best gentleman or nobleman of the band, albeit for birth or calling otherwise they were farre his betters: so pliant and obedient they are to their commanders. But our officers will not bestow so much paines in training of a new souldier as a good Quierie or Rider would do vpon a young horse, as though a man were not more worth than a horse, or more honour to be attained in training of men then of horses.

Item that he be of some occupation, not trained by in idlenesse: for of all other the Russian (that liueth idely, & seeketh the warres onely in hope of spoile) is most unfit to make a souldier: yea, by experience it is commonly sene, that

that they are the onely cause of Mutinies, and one such is able to disorder and corrupt a whole band.

That he be skilfull in the weapon that he useth, & haue also the quality of swimming.

Item that he exercise himselfe continually at idle times among his companions in the Campe in running, throwing the barre of such like, to make him actiue, and to auoid such idle pastimes as souldiers commonly now a dayes vse, contrary to all good order.

That he be in expences moderate, rather sparing than spending, & his expences to be rather in Armor & gallant furniture, than in excesse of meate or drinke.

That he keepe and preserve his armor and weapon as one of his members: and that he be detested more than a Coward that shall lose or play away any part thereof, or refuse it for his ease & to auoide paines, such a one should not after be suffered any more to weare armor but either with shame and punishment to be dismissed, or made some abiect Pioner.

For a Pikeman the Corselet is the best kind of arming.

And the Harquebusier with a light Brigandine or doublet of plate, and a Purrian. The Halberdier may arme either with a sure Brigandine, or Corselet. But aboue all other for a day of battaile, the old Romane shield, and the short sharpe pointed sword, which to execute in a thronge of men excēdeth Halbert, Blackbill, and all other.

He ought diligently to attend, & obediently to execute all such commandements as his Captaine, or other officer of his band shall enioyne him.

He must by continuall and heedie practise endeuor himselfe persitely to know the sound of the Drum, which being wel vnderstood should be a very persite guide of the souldiers march.

Item that in the field he haue alway a speciall regard to his Ensigne, so that if hee see the same in any daunger to be surprized by the Enimie, that he endeuour himselfe

by all meanes (without any respect of danger to p̄serue
oꝛ recouer the same, foꝛ the losse of the Ensigne is not only
to the Ensigne bearer, but also to the whole band a perpe-
tuall shame.

The Souldioꝛ ought in his apparell and armoꝛ to fit
himselfe, that he be apt and readie foꝛ any manner service
that he shall be assigned to.

The p̄uate Souldier ought not onely to be well able
to vse the weapon he serueth withall, but also sodainely to
vnderstand all commandements of his Gouvernors, whe-
ther it be by voice oꝛ sound of Drumme, oꝛ otherwise, and
to know how to maintaine himself in order without brea-
king array, not only marching, but also turning in troupe
oꝛ retyring, which Discipline is almost in these dayes lost.
And that Souldier that knoweth his duety how to behaue
himselfe in the Camp, in watch, Scout &c. And likewise in
marching, turning, retyring and fighting to obserue the
order by his Captaine p̄scribed : Such a one may
be called a trained p̄uate souldier : and if he be ignozant
hereof, although he hath bene twenty yeares in the wars,
I account him not woꝛthy of y^e name of a Priuate Souldier.

Finally I would haue a souldier so soone as he is dismis-
sed, and out of pay, that forthwith he returne to his occu-
pation oꝛ foꝛmer calling, and not hold it any imbasing of
himselfe to returne to an honest trade of life, considering
in the most noble Gouvernement of the Romanes (who in
Militare vertue surmounted all other) you shall find how
from the Plough hath bene taken a Dictator, who deposed
Consuls, guided mightie Armies, cuer-ruled Kings, and
yet thought it no disgrace to returne againe to his p̄uate
estate, vendicating nothing but Fame and honoꝛ to him-
selfe, leaning & contemning the spoile, & contēting himself
with his owne poꝛe possessions. Such noble p̄sidents ought
Captaines to lay befoꝛe their souldiers eyes, & to beat them
from that coꝛrupt opinion of Riches and Pleasure, which
are

are the enemies of vertue, and the very original causes of the ruine of many stately Empires and common weales.

*Tum casa parua viros & frugi Mensa ferebat
At nunc Delicie & laqueata Pallacia, molles
Imbelle/que edunt fetus, & lussibus aptos.*

CHAP. II.

The office of a Corporall.

As the Corporall is a degree in dignitie aboue the private souldier, so ought he also in wit, discretion and diligence to surmount his inferiours. There may be of these in euery band more or fewer at the discretion of the Captaine: but commonly now a dayes there are assigned to euery 20. or 25. Souldiers one Corporall.

This Corporall ought to keepe continually companie with his little Troupe committed to his charge, to lodge with them, and provide for their want, & to instruct them how to handle and vse the weapon they carrie.

He ought to remember perfectly well how euery one is armed and furnished when he receaueth them in charge, and to see that no part thereof be spoiled, but be preserved neat and trimme.

He ought to looke well to the behaviour of his Companie, not suffering them to vse vnlawfull and prohibited gaming, neither to geue themselues to drinking and surfeiting, but to spare of their owne pay to furnish themselues bravely and surely against the Enemy; wherein he ought to vse his chief endeuour.

He ought not in presence of his Captaine or other superiour officer to take vpō him more then as a private souldier, and diligently to attend to execute what they shall commaund, that his Example may serue as a president to the rest.

But when this Corporall shall with his Companie be brought to the place where he shall Watch, he must provide

himselfe of woode and coale to haue alwayes light in the body of his watch, and in such sort to order his Scoute or Sentinels, that he may sodely be able to aduertise his Captaine of any accident that shall arise, and that without disorder and tumult of his Companie.

This Corporall also ought to deuise in some sort to fortifie the place where the Bodie of his watch shall stand, in such sort, that vpon the sodaine they be not enforced vpon the comming of the Enemie to abandon the place.

Also immediatly vpon the shutting of the Euening, he ought discretly and warely to order his Scoutes, and son- dy times in the night to reuiew them, continuing this diligence euen till the dawning of the day, and therein to employ his souldiers of greatest trust.

Also it shalbe couenient, in place of great suspect, that he appoint double Scoutes matching an Harquebuzier with a Pike-man, that both they may the better be able to defend themselves being assaulted, and also by discharging of his harquebuze geue notice to the body of the watch, that they may geue further aduertisement, and also put themselves in readinesse to abide any sodaine attempt: who ought not to abandon their place, but by the special licence and commaundemēt of the Captaine, or Sergeant Maior, and then to retire themselves in order to the troupe. And this may best be done if the Corporals be also interlaced, videl. a Corporall of shot matched with a Cozpozall of pike or short weapon.

The Corporall must also see these watches maintained with Silence, to the end that they disquiet not the rest that should take their ease: And if it happen that any fault be committed, his part is not violently to punish the souldiers himselfe, but to make it knowne to his Captaine, who must not neither, (as some rashly doe) reuenge it himselfe, but communicate the same with the Marshall or his Prouost, who onely haue vnder the

the Generall, authoritie to punish . And this due course of Justice shalbe moze terrible to the souldier , and bzeede lesse ill will in them to the Captaine and Officers.

Some vse under euerie Corporall two Disniers , which the Romanes called Decanos , and Decuriones , euerie of them had the charge of nine souldiers , himselfe making the tenth : such a Companie of the Romanes , was called Contubernium or Manipulus : the which order is now reuiued among the Spaniards, and by them called Camerades , whereby their souldiers are kept in verie good order , and their furniture verie well and neatlie preserued.

CHAP. III.

The duetie of a Dromme.

The duetie of a good Dromme doth not so much consist in knowledge of all variety of Marches fozeine, videlicet , Almaine , French , Italian , Spanishe , &c. as to be able readily to sounde our owne , swift oꝛ slow as he shalbe directed by the Dromme Maior of the Regiment . And also to know how to sounde a Retreit , oꝛ a Stand , with such other varieties as in seruice are necessarie . All which they are to learne of the Dromme Maior , to obserue vniformely one course in all their Companies and Regiments.

He ought also to be a souldier of Experience and Iudgement, that being sent to the Enemies Camp of Message foꝛ Prisoners oꝛ other occasions , he may be able to note and marke matters of importance to informe his Captaine oꝛ Collonell at his returne.

He ought to haue Language aswell to vnderstand what is said , as also to deliuer such message as he shalbe sent withall : this officer being commonly sent foꝛ redemption of prisoners, and such like occasions.

It is fit to haue in a band two Drommes, that one may alwayes remaine with the Ensigne, if the other happen to be sent with a Squadron to watch o2 warde: Albeit I like not so well of watching by Squadrons as by Entire Ensignes, for many seruiceable respects.

He ought to be Secret, and therefore no Dronkard no2 such other childish o2 abiect person, as Captaines sometimes (that regard not their credit) for lucre will chouse o2 admit, passing boyes o2 other baddy persons (that will take least pay) in their musters for Drommes, conuerting the most part of their pay to their owne vse.

There ought to be a Dromme maio2 of euery Regiment, of such perfection in his Art as all the inferio2 Drommes of particular bandes should of him learne their Arte and dueties, they are all to be obedient to his directions, and in seruice to giue diligent eare to the Dromme generall. For it falleth many times out (in great encounters) that the voyce of the chief commaunding officers cannot be heard, & then must all directions be giuen by the Dromme o2 Trompet among both footemen and ho2slemen.

This Dromme maio2 therfore o2 Trompet maio2 must be men of great perfection in their science, and by them the other Drommes and Trompets are to be taught: and for lacke of good order herein there are scarcely one among twenty that know their dueties.

CHAP. IIII.

The duetic of a Surgeon of a Bande.

This officer ought to be a man very skilfull in his Art, for that otherwise many times (by his unskilfulnesse of Surgeons) small woundes are made sometimes Maymes, and sometimes Mortall. It is therefore fit that no Surgeon in any Bande be admitted till the Surgeon maior of the Regiment haue examined well his skill &c.

He ought also to be provided of a good Cheast of Salues,
Oyles,

Oyles, and waters for killing the heate of shot, and all such Instruments as are necessary for his Art: without which and his testimoniall from the Surgeon maior or Surgeon generall, of his sufficiencie, he ought not to passe muster, or receaue pay.

He ought to be carefull, honest, and louing to the souldiers he hath in cure: and besides his ordinary pay of the Prince, he is to haue monethly somewhat out of euery souldiers pay, toward the charge of his chest or medicines, besides the reward of such as are of abilitie, to the end the more souldiers be cured gratis.

This officers Art alone would require a long volume to be particularly expressed: and therefore but briefly in generall termes touched, and referred for his sufficiencie and skill to the chief Surgeon of the Armie or Surgeon maior of the Regiment wherein he serueth: who ought alwayes to be a very choise person and most expert, learned and experienced in his Science: And for want of due care herein onely, a number of valiant men perish of very small hurts.

CHAP. V.

The duetie of a Clarke of a Bande

This Officer ought to be able both to write and cast accompts: for otherwise it is not possible for him to discharge his duetie.

He is to keepe a perfect Rowle of all the Souldiers of the Band as they passed at the first muster, containing both their Names, Surnames and weapons they serue withall.

He is to keepe perfect accompts of euery souldier in the band what he receaueth in money, victuall, armour, or apparel, and monethly or quarterly to see and shewe them what they haue receaued, and what remaineth due vnto them.

He is vpon the departure of any souldier to make him by his accompt, and to geue him vnder his hand a true note, what remayneth due to him of his pay, as he wilbe sworne to.

He is vpon receauing of any new souldier to present him to the Mustermaister or Commissary of musters for the garrison with his Armes, to the ende the souldier may receaue his othe and to be entred into the Princes paye, taking a ticket or billet from the mustermaister or Commissarie of musters of the day of his admittance into Paye.

He is (besides his paye due from the Prince) to haue a certaine monethly of euery souldier for keeping their accomptes, which is sometime more or lesse according as shalbe established by superiour Officers or agreed by the Captaine and souldiers at his entrance: And if he discharge also the duetie of Harbinger (as is most conuenient) then ought his allowance to be the better. For he is also to deliuer euery souldier his billet for his lodging, when they are lodged in Townes, or procure the same from the Magistrates for them. And in respect of his extraordinary paynes in these causes, deserues the better allowance.

This Officer of all other ought to be an honest man and of a good conscience: for otherwise hee may doe great wronges to poore souldiers, of whom the most part can neither write nor read, and therefore must relie vpon his honestie: and as he deserues good prayse and pay being honest, so for the contrary he should receaue both shame and punishment.

He ought euery moneth once to call the souldiers together to acquaint them with their reconings, and to shew euery man at euery monethes end, what is due vnto him: and neither for the priuate gaine of him selfe nor his Captaine to do any souldier a peny wrong.

He ought at all tymes when he shalbe called by the Mustermaister generall or by the Treasurer or Auditor of the Armie to shewe forth his booke of accompt, and if it be founde he keepe double booke, one to shewe these Officers, and another for the Captaines benefit to abuse either the Prince or souldiers, hee is not onely to be checked of all his Paye, but also to be punished for example seuerely. And for the better declaration of his duetie I thincke it not amisse in this place to adioyne the same Ordinance that was in the tyme of the Earle of Leicesters Gouvernement established by the Lord Buckhurst, Sir Iohn Norryes, and such other as were his assistants in Counsell till the returne of the Earle of Leicester.

Certaine Articles to be published by Proclamation in all garrison Townes or other places where Bandes of Souldiers are, that no Clarck pretend Ignorance thereof hereafter.



Whereas it hath pleased the Queenes Maiestie: of her most gracious and especiall care of her souldiers, to geue commaundement to her Treasurer at warres in presence of her Officers of musters, to make their paymentes hereafter by the Poule, to the ende no man should be abused or defrauded of any part of his wages: And for the better performance thereof and redresse of all other disorders or abuses, hath sent the right honorable the Lord Buckhurst her Maiesties Embassadour into these Prouinces: His Lordshippe with the aduise and assistance of the Coltonell Generall and other Officers of her Maiesties Armie, seing many difficulties in this kinde of payment, hath found it very conuenient.

That the Clarkes of all Bandes in her Maiesties pay
 aswell horse as foote, shall every Moneth make up per-
 fect reconings with the souldiers of their Bandes, deli-
 uering a billet to every souldier, expressing what he
 hath receaued, and what remaineth Due vnto him of his
 monethlie paye. And also to keepe perfite monethlie
 bookes of the said reconings and billets as they wilbe rea-
 die to present vpon their othe, whensoever by the Mu-
 stermaister generall, or other officers of musters they
 shalbe required. And that they begin their said moneth-
 lie bookes from the eleuenth of Aprill last past exclu-
 siue.

And to the ende no Clarckes shall haue occasion for
 want of conuenient enterteinement to deale corruptly,
 but iustly and truely to yeld the souldier a true account
 of his due: wheras heretofore their vsuall fees hath bene
 of every souldier onely two Stiuers a moneth: It is now
 ordered, that it shalbe lawfull for them to receaue of
 every souldier in their bandes foure pence sterling for
 every pound due vnto him of his monethly wages, and so
 ratably of every Captaine or other officer of their bands.
 And then if at any time it shalbe discovered either by the
 Commissioner of musters or by any other meanes, that
 any Clarcke shalbe lawfully conuicted of any corrupt or
 false dealing, to defraude either her Maiestie or the soul-
 diers of their Due, he shall not onely forfeit all Pay due
 vnto him vpon his enterteinement, but also be commit-
 ted to prison till such time as the Lord Generalles plea-
 sure be knowne, what further punishment shalbe layd
 vpon him. And if any Clarcke shall refuse or neglect to
 performe his duetie according to the tenour hereof, he
 shall likewise forfeit all paye due vnto him, and be com-
 mitted to Warde, without bayle, till the Lord Gene-
 rals order be knowne, what further punishment he shall
 receaue for his contempt or negligence, according to the
 nature

nature and qualittie of his offence. Given at Vtrecht this
15th of May. 1587. Anno Regni Elizabeth. &c. xxi.

T. Buckhurst.

J. Norreis.

T. Sherley.

Thomas Digges.

CHAP. VI.

The duetie of a Sergeant of a Band.

This Officer ought to be a man chosen of quicke spirit,
and active body, able both sodainly to conceiue, and
painfully to erecute: And to the end he be not stagge-
ring and astonied vpon new Accidents, but prompt & rea-
dy vpon euery sodaine to doe that to him apperteineth, I
would wish that he should passe both the former grades be-
fore he be admitted to this.

This Sergeant ought perfectly by memorie to know
euery souldier within the band, and how he is armed, who
be Halberdiers, who Pikemen, who Harquebusiers, who
billmen &c. which are well armed, and which not, that he
may vpon euery sodain place them accordingly, arming
the vtmost rancks with the surest men and best furnished.

He ought (when occasion is) to sort his men, euery kind
of weapon by himselfe, and to dispose them in a certaine
number by rancke, as foure, five, sixe or seuen in a rancke,
accordingly as he shal by his Captaine or Sergeant Maior
be commanded, teaching them to march forward and back-
ward, and also to turne without disorder.

He ought to assigne to each souldier his due place, not
suffering them to contend or fall out among themselues
for the foremost or better place, but therein to vse this in-
differencie, that the best Armed be placed in those places of

Force, whereby not only in time of p^{ro}se they are in more securitie, and the band that way the more gallant in shew: But also the souldier (to gaine the place of more account) will spare of his pay to arme himselfe the more brauely.

The Sergeant also ought (if victuall want, or Pouder, or shot, or match, or any other necessarie) immediately to make it knowne to his Captaine or other officer for that cause appointed, and to get it for them as good cheape as he can, and afterward to distribute the same among the Corporals, giving order that it be by them iustly and equally distributed among the Souldiers.

To this Officer it appertaineth as well in receiuing as in laying out to p^{ro}uide all things for the Campe, saue only lodging, for that appertaineth to the Harbinger. And therefore me thinketh it were requisite that this officer should be able to write, for it is hard by Memorie alone to discharge so many things well as he shalbe charged withall.

He ought alway to accompany the watch to the place where they shall stand, and then to giue order to the Corporals that they vse great diligence in sending and setting their Scouts, and finally at his departure to giue him the Watch-word, which he shall receiue from the Sergeant Maior or Marshall.

He ought with great diligence to attend that the Sergeant Maior or his Captaine shal command him, & to see it speedily executed, rebuking & teaching such as do amisse, shewing their faults: but in no wise to strike or beate a Souldier, for thereby he makes himselfe woorthy of that punishment the souldier otherwise for his fault should haue.

He ought himselfe to be thoroughly well Armed and appointed, as well to defend as offend, and after he perceiuethe things wel in order, then ought he to clap himselfe in array with them, but in such place as he may sodainly step forth

forth and remedie any new disorder, and to returne to his place againe : for the diligent and skilfull vsage of this officer, is of no small moment to maintaine good order throughout the whole band. The Halberd is the proper weapon for this officer to carrie.

This officer among the Romanes I cannot finde, neither in these daies (if other parts of Romans ordinances were renewed) should we neede them, but till a perfit reformation of all disorders, this also may be tolerated.

CHAP. VII.

The office and duetic of the Ensigne
of a Band.

As it is conuenient for euery souldier to stand vpon his credit and reputation, accounting no losse of goods comparable to a dishonorable foile : so ought especially this officer to whom the Ensigne is committed, aboue all other to haue honorable respect of his charge, and to be no lesse carefull and iealous thereof, then euerie honest and honorable Gentleman should be of his wife.

Also I like well some Ceremony should be vsed in deliuering of the Ensigne, and that he receiue it by oath in presence of the band, & that euerie priuate souldier should be swozne also to the Ensigne as among the Romanes it was vsed, when he was not accounted a souldier, but a thiefe or a robber, till he had taken his oath, and therefore was called Militia Sacrata.

Also he ought to haue with him two or three assistants of the most honest and valiantest souldiers of that band, to whom vpon any iust and vrgent occasion he might commit for a time the charge of the Ensigne.

He should march aduisedly & coragiously wout affectatiō or vain brauery, not bowing his body, or vncouering his head to any, but to y General, Coron. Cap. or other his bet- ter to do reuerēce, only by abasing & enclining y top of his

Ensigne moze oꝛ lesse as the partie is in degré his superioꝛ.

He ought to know that the Ensigne in set battailes ought neuer to change from the middle of his Band, but in marching loose, in scaling of a Foꝛte, oꝛ assaulting a breach, the Ensigne should indenuour himselfe to be the first and foꝛmost.

He ought so to behaue himselfe that he be beloued of all the souldiers, considering thereby not onely his owne person shall be in moze safetie when he attempteth perillous exploits, but also the whole seruice moze bꝛauely and honorably exploited: foꝛ the value and vertue of the Ensigne setteth foꝛth the vertue and valour of the Captaine and whole band.

He ought alway to haue attending on him a Drumme oꝛ two, to gather his souldiers together when néede is, and foꝛ other necessarie respects.

I thinke good he be allowed his hoꝛse with him in marching, but his baggage to be carried among the rest with the ordinarie carriage of the band.

Let the Ensigne be a man of god account, honest and vertuous, that the Captaine may repose affiance in, and not as some Captaines fondly do commit the same to some of his inferioꝛ seruants.

The Ensigne-bearer ought to be well apparelled: and to giue the moze reputation to the office, let him alway haue a Gard to attend vpon the Ensigne, as well in place of suspition, as otherwise, and those to be altered at the Captaines discretion.

He should be continually Armed, as wel when no perill is feared, as in time of danger, to giue example to the rest of the souldiers not to think their armoz burthenous, but by vse to make it as familiar to him as his skinne.

The Ensigne should be so marked that both farre and néere the band may know it from any other in the field.

The

The Ensignebearer ought when the warre is ended, to deliuer vp to his Captaine againe his Ensigne, & although he haue either in battaile or assault so valiantly vsed himselfe, that he haue indeede deserued the same as an honorable remembrance of his valure, yet should he rather accept it by the assignement of his Captain, then to seeme to vendicate it as due.

This officer was also among the Romanes, & was called Signifer, or Bandophorus, a person (next their Captaine) of greatest reputation: as at this day he is with the Spaniards, who admit no other Lieutenants in their Bands.

CHAP. VIII.

The Lieutenant of a Band his office.

The Lieutenants office, as it is of credite and reputation, so is it also an office of great toils and paine, the which he ought willingly to suffer, as wel to discharge his Captaine of toils, as for his owne Reputation.

He ought not to vendicate to himselfe any authoritie, but thoroughly to vnderstand and report to his Captaine the state of things, and from him to take his commission and direction.

He ought frankly & faithfully to giue his Captaine his aduise, as oft as it shalbe demanded, but not to presume to aduise his Captaine vndemanded, vnlesse it be in case of present perill.

He should in all factions or questions among the souldiers be altogether Neutrall, & louingly to worke with them for pacification, & if he cannot by curtesie frame them, let him communicate the matter with his Captaine, and then faithfully execute his Captaines direction.

He ought neuer during the time of seruice to haue question with any, nor suffer any other to commit any like disorder: for in euery band ought severally to be prouider

It appertaineth to him to ouerse the Sergeants, and Corporals that they do their duetie, and oftentimes with his owne person to aide them in setting the watch, &c.

He ought many times to reue to the bodie of the watch, to see how they execute their duties, keeping them vigilant and diligent to their charge.

He ought brotherly and friendly to vse the Ensigne, aiding him with his aduise, and to be a friendly Mediator to the Captain for the inferiour officers and souldiers for their pay or any other want.

He ought both to see the other inferiour officers do their duetie, and also that they be obeyed without contradiction, and that every Squadron or bodie of the watch haue their Armes, weapon &c. sorted in readinesse.

I hold it also conuenient that these litle bodie of Gard or watch be not of countrie men or neighbors, but mixt one with another, to auoid factions & other inconuenience.

In absence of the Captaine, he ought to be obeyed and honored as the chiefe, but in presence of the Captaine, not to take vpon him any such authoritie.

He should be able to speak wel and sensibly, to expresse his mind, that the souldiers might vnderstand him, how, and what they haue to do.

He may haue his horse, because he hath occasion more then other to be stirring about the band, to see and prouide for all disorders.

His baggage and Prouision should (euen as of euerie other souldier) be as little as possibly he may, & the same to be carried among the ordinarie prouision, with the rest of the prouision of their band.

This officer I finde not in the Romane armies, neither see I any cause why in these dayes we should need them, if the Ensigne and other officers sufficiently knew their duetie.

The

CHAP. IX.

The office and duetie of a Captaine.

A Captaine ought to consider that he hath the charge of the liues of men committed to his hands, and that if any quaille vnder his conduct, either by rashnes or want of knowledge, he is to render account therof befoze the great Iudge. Considering therefore his important charge, he ought (befoze he take the same vpon him) to passe some of these former degrées, and that in place of seruice, whereby he may finde his owne sufficiencie to discharge a place of such importance.

He ought first to make choice of sufficient, expert, honest painefull officers, a skilfull Lieutenant, a diligent Sergeant, vigilant Corporals, a godly Priest, a trusty Clarke, or Register, a prouident Harbinger, a cunning Surgeon, with necessarie provision, & two or thre good Drummes.

And after he hath brought all his companie together, he shall solemnely deliuer the Ensigne to a chosen man for courage and honestie, causing him in presence of al the company to take his Oath, &c.

He shall also make choice of two or thre of the expertest Gentlemen of his band, that are wel able to discharge any of the inferiour offices, these may be named his Lieutenants extraordinarie, and these he is alwaies to haue about him vpon any sodaine, to execute his commandements, and aid his other officers when time shall serue.

The Captaine ought perfectly to know what appertaineth to the office of euerie of the forenamed inferiour officers, that he may presently redresse any thing amisse, and giue them instructions and order vpon euery new Accident, either in Marching, Encamping or fighting, what they haue to do.

He ought alwaies to be in presence of his Coronel or General

to be informed of euery particularity y^e is determined, that he may be the better able vpon any occasion to exploit such service as is commanded, to the hono^r of his Coronell, and reputation of himselfe and his souldiers.

He ought to take order for the carriage of the baggage of his souldiers, & to see that they haue as little superfluitie as may be possibly, to the end they may both moze speedily march, and also vpon any service be rather forward to take from the Enemy, than haling backward for feare to lose their owne.

He ought not to be couetous or niggardly: neuer to keep back his souldiers pay, but by al means to seeke to get them their pay, & to his abilitie rewarding them ouer and aboue, for by that meanes he gaineth hono^r, and maketh them assured to him in any perilous service. And contrariwise if he be a scraper and spoiler of his souldiers, & bend his wits rather to pray on them & their pay, then to traine and teach them their dutie: Such a one ought to be disarmed and reiected as a baseminded mercenarie marchant, that shameth and soileth his profession.

He ought not to suffer any souldier saue onely his principall officers to haue any horse: In his officers it is tolerable, because they may sometime serue for Light horsemen to discover &c.

He ought to haue knowledge in Fortification, especially in the manner of making trenches and Rampiers, for as well in defending, as assalting, they are often vsed.

He ought neuer to be disarmed of Lāternes & Torches for the night, such as in any storme or tempest will burne: for many times they may stand him in singular stead.

He should alwaies lodge himselfe among his company, and endeuour himselfe to tollerate paines and hardnesse, for it is no smal comfort to the souldier to see his Captaine take such part as he doth, and contrariwise taking his ease, and suffering them to be lodged or fedde miserablie, breedeth

breedeth him hatred or contempt.

He ought every night that watch is kept, to send his Sergeant to the Sergeant generall, or other officer that deliuereth the watch-word, and the same to keepe very secretly and vse it warely, for negligence therein sometime breedeth many mischiefs.

The best order of watch, is by the whole and entier Ensignes, and not by Squadrons or Corporals taken out of bands, as in disordered warres (among many other abuses) hath bene accustomed: A deuise inuented onely by some lucrous persons, to couer the weaknesse of their bandes, whatsoeuer other colour be pretended: And it is the Captaines duetie himselfe to walke the Rounde, to see how all inferiour officers doe their dueties, especially in time of seruice. And for want of this care, Townes of great importance haue bene lost, by surprizing some places of aduantage for want of due gard and vigilancie in the Captaines, which ought seuerely to haue bene punished not so much in the inferiour officers, as in the Captaine of the Bande.

He ought to be well practised in all these particularities: For a good wit without practise wilbe to seeke in these matters, and if he be not also valiant vpon sodaines, he shall neuer be able to execute his duetie.

He should be eloquent, and able compendiously & plainly to vtter his minde, and also to perswade and dissuade: to recreat and sometimes to prouoke and stirre vpon mens mindes, which oftentimes in these painfull perillous actions languish, and haue neede of quickning.

He ought not to beate his souldier, but deliuer him to his Marshall or his Prouost, to haue him punished, for in beating of him he maketh himselfe hated, and embaseth himselfe, and maketh his souldier either mutinous or abiect.

He ought continually to keepe his souldiers occupied in actions militare, making them sometime shoot for wagers with harquebuzes, sometime to wrestle, to runne and to

leape in their armour, to march in aray, to cast themselves in a ring, to retire in order, & marching sodainly to stand, & such like, wherof the Captaine may deuise infinite variety, both to delight & also make his souldiers perfit, & so farre better spend their time, then in idle lewd pastimes.

He ought not to do any thing with his souldiers, but to haue his Ensigne, and his Drumme with him, as well to geue the more reputation vnto the action, as also that the vse of the may be well knowen, & vnderstand of all his souldiers.

Finally a Captaine ought so to behaue himselfe as he be both loued and obeyed of his souldiers, and that they as well know how to obey, as he to commaunde, and that he endeouour himselfe by all meanes to annoy the enemy, and painfully to execute, with all diligence, such matter as he is inioyned by his Superiours; and to feare nothing but infamie.

Of Captaines there were two sortes among the Romanes, the one was Centurio, who had charge of 100. men the other was called Comes, or Cohortis Praefectus, & had the charge of one Battalion, vnder whom there were diuers Centurions, but one onely Ensigne, for euery Centurion had not his Ensigne, as in these our disordered warres is accustomed.

CHAP. X.

The office and duetie of a Collonell or Camp Master.

This office or calling is in reputation as farre aboue a private Captaine, as a Captaine aboue a private souldiour, and Captaines ought with like duetie to obey their Collonell, as themselves expect to be obeyed of their souldiers.

He ought therefore not onely to be a man of great iudgement and reputation, but also it were fit he were a man of liuing couenient, liberall & not prodigal. For whereas needy and prodigall persons are aduanced in this place, they are

are enforced to become raueniers and scrapers, and being such theſelues, are likewise enforced to tollerate the ſame in their inferiour Captaines, & ſo the poore ſouldier is miſerably pilled oppreſſed and ſtarued.

I may not here omit a notable diſcourſe of Francis Guicciardine in his Italian ſtoꝝ vpon the ſucceſſe of the French Armie that entred Italie vnder the conduct of Charles the viij. That like a tempeſt of thunder and lightning paſſed violently thꝛough all the ſtrong States of that famous Prouince, and neuer met with any that were able to abide the furie of his Armie, albeit himſelfe were very young, and neither foꝝ perſonage, chiuallrie oꝝ experience any thing in him extraoꝝdinary. But ſaith Guicciardine, this Army was not ſo terrible vnto the Italians in reſpect of the number, but foꝝ the valure of the ſouldiers: foꝝ, ſaith he, the ſouldiers being almoſt all choiſe ſubiectes of the kings and not to be altered and changed altogether at the diſcretion of their Captaines, noꝝ yet payd by them, but by certaine miniſters and officers of the Kings, their companies were not onely complet of men, but their ſouldiers in hart courageous, well hoꝝt, & armed, &c. He addeth further that in Italy ſe cuſtomes were then quite contrary: foꝝ the ſouldiers there were wholly at ſe diſcretiō of their Captaines, and payd by them, & ſo wholly depending on them, and thereby the companies wanting their complet numbers, and many other abuſes being committed (as is there moꝝe particularly recited,) the Italians (that otherwiſe foꝝ their particular are a moſt valiāt people) receaued ſo many ſoyles, and that French Armie (being foꝝ number but meane) atchieued ſuch honour and renowne.

But Militare diſcipline being in theſe dayes almoſt in all Nations by reaſon of Ciuill diſſentions reduced to the Italian coꝝruption of that time, and as a body poſſeſſed with a feuer, abhoꝝring not onely all due medicines, but alſo all wholeſome nutriment, and not to be refoꝝmed but

by hinges, that (being actually in person in the field themselves, as Charles was,) may with their owne eyes, eares, and handes, see, heare and feele the horrour of these corruptions, and not be abused by the gloses of lucrous persons: I leaue further to wade in that discourse, & to returne to the duetie of a Collonell. I say.

The Collonell (so soone as he is elected by his Prince or Generall, and hath receaued his Patent and money for the leuying of such a number of men, as are to his charge appertaining) ought immediatly to make good choise of his Captaines, assigning such number of men to euery one of them as he seeth cause, according to the experience and ability of the persons.

The more Captaines and Officers that he maketh, if they be able men, the more readily and the better also shal he take order for the good execution of any seruice, but by such multitude of Officers, the Prince shalbe ouermuch burdened with excessive pay, the wisdomer therfore of the Collonell must be in this, that he so distribute and diuide his companie, as neither a conuenient number of officers be wanting, nor yet the Prince overcharged.

He ought immediatly after he hath elected his Captaines, to deliuer them Imprest money, to euery one severally such a portion as may suffice, the which he ought to cast before hand, that he may from his Generall receaue allowance accordingly. For it is requisite that in the beginning men be not discouraged for want of necessarie provision, but in such sort provided for, that the souldiers may grow into a liking of their Captaines. And if the Collonell sometime of his own lend to his Captaines, he shall greatly binde them, and without any detriment, considering he is sure to be answered the same againe vpon their pay.

He ought also to make him a Lieutenant, who, besides his owne particular Bande, ought to take like care of the Regiment, that hath bene already declared of a Lieutenant

In a private band.

He ought in like maner to create him a Sergeant Maior, such a one as hath bene not onely of good experience in service, but also in this kinde of service, so2 to him it appertaineth sodenly to put men in aray, to alter and change them as the place or occasion shall require, besides many other partes that hereafter moze plainly I will entreate of in the duetie of the Sergeant Maior.

He ought also to appoint his chief Harbinger, who ought diligently and indifferently to assigne fit lodgings to euery band, and then the harbingers of euery band are to distribute the quarter appointed, among the officers and souldiers of the band.

In like maner he ought to make good election of his owne Ensigne bearer, who should be in value and reputation, a man aboue the rest of that calling.

He should likewise make a chief Drumme that should take charge of the rest, instructing them in all particularities, that they may both agrée, and readily execute any orders by the Collonell commaunded.

He ought to see that he want not of Cozlets, Purrians, Brigandines, Halberds, Black bills, Pikes, Bowes, Harquebuzes, lead, match, powder and victuals that may suffice for his Regiment: and for all these things that his souldiers be not exacted on in the price.

And aboue all other things let a Collonell take hárde that hee be not noted to be a piller of his souldiers, or to play the Marchant making his gayne vpon them in selling them furniture vpon excessive prices, for there is nothing so repugnant to the honorable profession of a Collonell, as to be noted miserable and an extortor vpon his souldiers.

He ought also to examine the choise that his Captaines haue made of their officers, and if they be good to allowe them, or els not.

If his Regiment amount to the number of a flue or six

thousand, then shal he not neede other horse then those that are allowed to the officers of 5 Bands, who may serue the turne for discouerie, &c. But if his Regiment be small, I would wishe he had an hundred horse at the least, which should be Harquebuziers: for in winnyng a passage from Pesantes and vnarmed men, or fetching in a bottie, they are singular good.

He should haue about his person certaine wise, expert valiant Gentlemen, that be able vpon any sodaine to execute any of the inferiour offices, and that are able both quickly to conceiue, and plainly and sensibly to vtter any new accident, or thing whatsoever that he shall see. And these ought he to haue continually about his person, to execute such matter speedely and faithfully, as he should commaund them. These may be named his Lieutenants extraordinarie.

It is also the part of 5 Collonell to assigne euery Captaine, what kinde of weapons his souldiers shall vse: and albeit the present custome be that euery Captaine should haue in his hand both Pikes, short weapon, & shot, yet do I hold it far better for field seruices that they should haue in their hand but one sort of weapon: For by that meanes in euery seruice, the Captaine should alway accompany his owne souldiers, whereas otherwise if he will abide in the standing battaile with his pikes, he must commit his shot to be led by an other, & his short weapon by a third, which is an extreme disorder. And nothing so much discourageth the souldier as to see his Captaine a companio of his perils, and the contrary no lesse dismayeth him.

But aboue all things he ought to cary such a loue to his souldiers and regard of his honour, that he should rather chouse to dye with them in fight, then shamefully to abandon them in the day of battaile, or by horse to saue himself, while they are cut in peeces: A thing too vsuall in these dayes, where commaunders of fame doe not onely com-
mit

mit so foule a treacherie, but are so farre past shame, as many tymes in their ordinary discours to vaunt how many times they haue saued themselues, while their souldiers haue bene butchered. I deny not but a valiant man may sometime be enforced to flye, as an honest woman may also by Rape be possessed: But as it were extreme impudencie in a woman to vaunt of such mishap, so in a Commander or Captaine most foule to vaunt of such his foyles, which in these dayes are growne so vsuall, as some hold it no moze shame to saue themselues by flight and treacherously leaue their souldiers to the slaughter, then a comunon Curtizan doth to abandon her body to filthy lust.

Finally he ought alwayes to attend in the presence of his Generall to honour & obey him, and to refuse no paynes in exployting his commaunded Seruices, for those paynes are honozable, they get the Fame, and make the immortall.

This Officer was also in vse among the Romanes, and was then called *Drungarius*, *Tribunus Militum*, and *Chiliarchus*, and commonly in euery front or face of their battailes, they had two or three of these Tribunes or Collo-nels, and the Gouvernour of the whole front was named *Turmarca*, *Merarca* or *Turmarum p[re]fectus*, comparable in some respectes to the Captaines of the vaward Battaile and Rereward, sometimes in these dayes vsed.

I thinke it not amisse in this place to adioyne certaine Notes for trayning of souldiers such as my selfe in the Lowe Countreyes deliuered to sundry of such Captaines as I founde more bent to get honour by their Souldiers lues, then gayne by their deathes.

Brief Notes for trayning both of the souldiers particularly, and the Bandes together in euery garrison, but especially of the fire before they be brought to deale with the enemy.



Orasmuch as good shot, of all other weapons in the field for all kind of *seruices*, is of especiall accōpt, if they be vsed & imploied as in deede they ought to be, and cōtrariwise as wastfull, vaine and friuolous being trayned and vsed as commonly heretofore hath bene accustomed: I meane now to deliuer some *Notes*, in what maner I would wish them exercised in their *garrison Townes*, that they may be capable of greater matters & able to do some Seruice, whē they shalbe brought to deale with the enemy.

In our vsuall trayning heretofore, these be the incommences that I haue noted.

First an extreme wasting of powder vainly, and the souldier not taught to vse, but rather to abuse his peece, seeking onely to charge and discharge speedely, neither regarding to charge soundly, nor to bestowe his bullet surely: whereby many thousande poundes haue bene wasted in powder vainely, and the *shot* not trayned but corrupted: whereas with the tenth part of that powder (so friuolously consumed) they might be made good, perfit and seruiceable shot in deede, and the treasure (thereby wasted) might be imploied to farre better purpose.

How shot may be vwell trayned vwith least charge and wast of powder.

IT were cōuenient that some *Butts* or other markes were erected at the foote of some *Rampier* or *Curten*, or some such

such like conuenient place, where no hurt may be done by ouershooting the same, when they shal be practised with the *Bullet*.

And first I would haue the *Corporals* to teach him by false fires in the pan only to vse his peece to finde his mark: and in giuing fire, neither to cast back his head, nor winke with his eye, nor stagger with his arme: but finde his mark still in sight after he hath giuen fire, which effectually learned, he is halfe trained.

Then let him bring them to the *But* or other mark, and teach them to charge well and surely with the bullet, and (observing that he learned by practise with false fires in the panne) he shall in short time learne to bestow his bullet surely at the marke, without staggering at the recule. And till priuately with their *Corporals* they haue learned thus to vse their peece, I hold it verie friuolous and wastfull for the Captaine to assemble them to trauerse their ground, & skirmish in the Field, as hath ben accustomed.

And whereas in all garrison Townes they ought and do euerie night at their *watch* charge their peeces with the *Bullet*, the *Corporall* should see that the next morning they do not discharge at aduenture, but cause them to assemble together, and bestow their bullets aduisedly at some marke neere their *Corps du gard*, giuing them due praise and commendation that best performe the same.

But besides these priuate exercises it were conuenient that euerie weeke some day be appointed by the *Gouernor* to euerie band for publike training of their shot, vpon which day the Captaine shall bring to the place appointed all the shot of his band: And there (after they haue bene instructed by their *Corporals* and *Sergeants* handsomely to handle their peece, and by false fires to offer to discharge the same, the Captaine may cause a sheete of paper or other marke of like quantitie (with a blacke spot or pinne in the middelt) to be set vp for a marke, to be shot at by

all the shot of his Band.

And to encourage the souldiers of his band the better to be trained, and to keepe their Furniture neate & cleane, and to practife well the vse of the weapon they carry, This order ensuing may be taken.

The *Captaine* may monthly bestow one of his 15 dead payes vpon the training of his companie in this manner, viz. Whereas the dead pay amounteth monethly vnto ten *Gilderns*, eight gilderns therof may be bestowed vpon the *shot*, 2 gilderns weekly at euerie day of exercise: one gilder vpon him that shall first strike the sheete of Paper, and the other gilder on that souldier that of all his company striketh neereft vnto the middle pinne of the marke. And because no contention shall arise among the souldiers for shooting former or later, there may a bagge of billets of their names be produced, & one by chance drawne out by the *Captaine* or some other by him appointed: That souldier he hath so drawne shall first beginne, and the rest shall follow in order as they are placed in the *Muster roule*, And in discharging of their peeces the *Captaine* may see that it be done in comely manner with good grace, and that they shall not repose or rest longer time in finding of their marke, then in seruice against the Enimie in the field shall be conuenient. And for the other two guilderns remaining, it may be bestowed at the muster day vpon such a one or two of the Armed men, as, for comely cariage of his Pike in *March*, or for readie aduācing, couching, or charging thereof, or for the neate and well keeping of his Furniture, or for the comely or well vsing of his *Halberd*) shall by the muster Master be iudged best to deserue the same. For these *Corporals* ought not onely to instruct their shot, but also the armed men priuately to vse the weapon they carrie: To march with comely and good grace, and particularly to shew them how to vse each weapon with most aduantage.

And

And the better to encourage their *Sergeants* and *Corporals* of euerie *Band* to take paines in the training of their souldiers: It may be lawfull for them (and none but them) to make prizes of ten shillings in value (such as the Souldier may weare for an ornament of his praise and commendation) and euerie one of these Prizes to be shot for by by such 30 Souldiers of that band, as will be content to venture their Teston a peece for a shot to gaine the Prize. And that he, which of all the 30 striketh neereſt the pin, for his Testonne to take the Prize. And so the Crowne ouerplus to be diuided among the said officers, as some reward extraordinarie of their paines.

By this meanes of commoditie, praise, reputation and gaine *Souldiers* will be induced to traine theſelues in those exerciſes that shall make them terrible to their Enimies, maintaine them in strength and health, and gaine them credite, reputation, and honorable aduancement.

Whereas now for want of this *Exercise* and *Training*, the most part are so raw and vnſkilfull in the carriage and vse of their weapon, that it is lamentable to behold: And the shot especially farre more perillous to their owne *Leaders* and fellowes, then to the Enemy, whenſoeuer they shall be brought into the field to ſkirmiſh, no better trained then now they are.

But if then any Souldier be found in any band of so cowardly and baſe a minde, as neither his ducie to the ſeruice, nor regard of his owne ſafetie, nor the hope of credite and aduancement, nor theſe allurements of gaine and rewarde now laide before him, can moue him to weare, vse and keepe his Armour and Furniture neate and cleane, and to take delight in the exerciſe of the weapon hee carrieth: Such a one (as a person deſperate euer to make a souldier) I would wiſh for example with ſhame to be diarmed and made a Pioner, to be alwayes imployed in the most abieſt, drudg-

ing seruile workes with lesse pay then any other.

And because against the best and most seruiceable actions there are commonly deuised some friuolous obiections by wayward heads to giue impediment: If any shall obiect that this training will consume much powder, and thereby greatly charge the poore souldier, I answere, that if they list to forbear but the one moitie of that shot which vainely they spend morning and euening in marching to and from their watch and ward, the same well spared superfluous expence wil abundantly suffice to performe these necessarie commendable exercises, being but 4 shot in the moneth for euerie priuate souldier.

The *Corporall* also may priuately teach them readily to cast themselues into 3. 4. or 5 in a rancke, and so in little troupes to follow him in the field, trauersing to and fro as he shall leade them: And with false fires in the panne onely to make offer on the knee to discharge their peeces making shew to charge againe, hauing alwayes this especiall regard to see their fellowes cleere of danger of their peece, before they giue fire or offer to discharge. And as I would not haue a souldier in the plaine fiede bound to stay so long as to finde his perfite marke or enimie in his sight, before he discharge: So do I hold him vtterly vnworthie to receiue pay, or beare the name of a *trained shot*, that shall not finde his sight thus farre forth, as to be sure to bestow his bullet betweene head and foote, though it be 8 or 10 score of: which is vtterly impossible, except he couch his eye to his peece, and finde the brest high marke before he deliuer his bullet: And such a one as thus can find his marke most readily, deserueth greatest praise. And after they haue bene thus farre trained priuately by the *Corporals*, they may be assembled by the *Captaine* to skirmish or exercise themselues in the field: which before this priuate learning, is meere wast of powder, and friuolous losse of time.

Exercises

*Exercises for particular Captaines in training
their priuate Bandes.*

THe Captaine (besides the vsuall kind of marching) should diuide his bodie of armed men into 2 sleeues to represent 2 *Battalions*, and then cause ech Corporal one after another, to bring out their Companies of shot before the face of these pettie *Battalions*. And deliuering their *volee* as it were at the Enemy, to retyre in safety betwene the armed men, and so to maintaine Skirmish as it were in a ring march.

The Captaine also should teach his shot readily, how to lyne a sleeue of his pikes for the better strength of both weapons if they should be charged with horse, either lance or pistolles, and that on either side, according to the seuerall weapon they shall be charged withall, and redily to breake out into skirmish againe without disordering or troubling his armed men.

The Captaine should also shew them the maner of winning ground, and also returning being pursued of an Enemie of great force, how to do it most safelie, and with the greatest spoile of the charging enimie by mutuall succors of Corporals, pursuing or retyring.

And after they haue bene thus far trained by their Corporals priuately, and also by their Captaines, then it shal be fit for the gouernors or chiefe Commander of the Garrison or *Sergeant Maior*, to draw forth some three, foure, or fise of the bands according to the number of Companies in the Towne, leauing the same in the meane time conueniently guarded, & to diuide their armed men into sundry *Sleeues*, *verses*, or *pettie Battalions*: Causing them to march forward and backward, to make their *Flanck* their *Front*, to retire in order of Battaile: yea to march vpon one corner, and turne their *Battalion* round, either on the left hand

or on the right, as one entyre bodie, without breaking their array. And also to couth their Pikes round if need be, and sodainly againe to aduance and march, or retyre readily as they shalbe enioyned.

And when the Armed men are brought to this readinesse, then it shalbe conuenient to draw forth their *shot* on the *wings* and face of these *Battalions*, to cause them to skirmish, to shew them in what manner they may retyre safely without encombring or disordering their armed men, whensoever they shall happen to be charged with Lances. And likewise they ought to shew them how to succour their Pykes, whensoever any attempt shalbe made by *Argoletiers* or *Pistols* to breake their array. To conclude briefly, they ought to be shewed all varietie of seruice, and taught how to behaue themselves vpon euerie accident, and seuerall attempt of the enimie. And when they are brought to this perfection, they may then be called trayned Souldiers. But without this trayning and knowledge (albeit they haue bene twentie yeares in a disordered warre, and bene in an hundred seuerall *Skirmishes* confusedly ledde without due discipline) they ought to be accounted (and are adiudged by the worthiest Generals, both ancient and of these our dayes) to be rude, raw, vnkilfull, vntrayned, and vnfit to be ledde to encounter the Enimie.

*Here ensue the dueties of the chiefe
Officers of the Field.*

CHAP. XI.

The Carriage master his Office.

The delicacie of our Warres (wherein not onely the chiefe Officers of the field, but particular Captaines, and

& many times priuate Gentlemen will haue their Tents) hath caused in all Armies such abundance of Cariages, as there is now more neede of this Officer, than in the ancient well ordered Romane warres: and yet euen then we may finde *Impedimentorum Magistrum*, which is the verie same our moderne Carriage master. Whose office is chiefly to see good order obserued both in the marching and lodging of the Cariages, that they cloy not vp the wayes, nor one hinder another in marching.

This officer ought therfore to receiue a Roule from the Lord Marshall, what Cariages shalbe allowed to euerie chiefe Officer of the Field, and likewise for Collonels and Captaines: And if any Gentlemen aduenturers be allowed their Cariages to haue a List also of them, and not to permit any other.

He is also to see that the victuallers haue conuenient place for their Cariages, both encamping and marching, and that they disturbe not the Cariages destinate to the bands of Officers of the Armie.

This Officer is (before the Armie march) to go forth with the Scoutmaster to take a view of the wayes, and also to conferre with the Guides, and with their aduise to resolute in what manner his Cariages shall march the next day, that neither they giue impediment one to another, nor encomber the straights wherby the Army should passe.

He is also to prouide not onely Cariages sufficient for the Armie, and horses to draw them, but also Carters, Wheelwrights, Carpenters, and such other Artificers as ought to attend, sodainly to amend and repaire any Carriage that should breake in marching.

Hee is also to foresee that there be prouision sufficient in readinesse of Ropes, Nailes, Horse-shoes, Leather for horse harneyes, and all such other thinges as shall be needfull, on sodaines to repaire that is amisse,

And he ought to haue Imprest and Commission to take things at reasonable prizes.

Brieflie he is carefully to foresee that there be nothing wanting concerning his charge when the Armie shall march: or if there be, to acquaint the Lord Marshall in time, and to haue order from him so; redresse.

CHAP. XII.

The Master of the Victuals.

This Officer (in al Armies that are not wel paid, or in such Countries as are not well storied with victuals) is verie necessarie, that there may be alwaies a sufficient store to follow the Campe.

He ought at his first entrie into his charge, to receiue from the Muster Master generall a perfite List of all the bands of horse and foote that shall passe to the Campe, raising vp particularly so; euerie Band what quantitie of Bread, Cheefe and Butter shall be necessarie so; their monthly and wekely prouision. And likewise so; such store of fish or flesh, as shall be found necessarie, according to the time of the yeare, and the place where the warres are.

He must so order his Prouisions, that they may arrive rather too soone then too late at the Campe, and yet in such conuenient manner, that his store become not stale or mustie: For there is nothing so much discontenteth the souldier, as bad and vnholosome victual, no; sooner breedeth mutinies and disorders.

He must also content himselfe with reasonable gaines, and not set such excessive rates as the souldier shal not be able to liue vpon. But this is also refozmable by the Lord Marshall and his Prouost.

This officer ought to haue such reasonable impresses be;
so;e

foze hand as he may be able in time to make his pꝛouiſiōs to the best aduantage foꝛ the relief of the poꝛe ſouldiers, who ought to be fauoured as much as is poſſible in the pꝛice.

But in ſuch countreys as are well inhabited, bſing Juſtice in the Camp, there ſhalbe no great neede of this officer: foꝛ men being well payd and not robbed oꝛ abuſed by the ſouldiers, there will alway follow the Camp a great Market, & yet this officer very fit to be kept in pay, as well to pꝛouiſe ſuch things, as are not bzought to the market, as alſo to enfoꝛme the Lord Maꝛſhall if victuals be too ex- ceſſiuely pꝛized, and to pꝛocure due moderation therein.

CHAP. XIII.

The Trench-master his office.

This Officer hath cōmaundement ouer all the Pioners, & is to giue directiō particularly foꝛ all earth woꝛkes (whether they be Trenches foꝛ incloſing of the Camp, oꝛ Sconces to be made againſt the enemy, oꝛ defences foꝛ the Artillerie.

He is to attend vpon the Lord Maꝛſhall and Maſter of the Ordinance, to ſee wherein they ſhould haue neede of his ſeruiſe: and according to their directions to diſtribute his Bandes of Pioners, ſome to one ſeruiſe, & ſome to another.

He ought alſo to receaue from the Muſter-maſter generall a perfit Liſt of all ſuch bandes of Pioners, as are en- rolled in her Maieſties pay, and to ſee their pay indifferēt- ly diſtributed among their Captaines (foꝛ this officer is in dēde their Collonell.) And to make two offices of this one is but a ſuperfluous expenſe, & encrease of the Princes charges to no end.

He ought to take reuietues of euery band of Pioners, to ſee whether they be furniſhed with ſpades, ſhouels, mat- tockes, and to giue direction to their Captaines in what

sort he would haue them sorted.

And bycause they may bee able also to defend themselves, & sometimes to doe some seruice vpon the Enemy, beside their labour: It is fit that euery Pioneer haue either his Pike or Browne bill whereupon in marching he may hang his spade or shouell, and in working pitch it downe by him in such order, as vpon the sodaine they may be ranged with weapon in their hand to make resistance.

It were fit that this officer had a band of Muskietiers alwayes attendant for the gard of these Pioners: & so being a man of iudgement, & hauing his Pioners thus weaponed (besides their labour in fortifications) he may many times do as good seruice as any other Regiment of the field.

This officer ought to haue some reasonable skill in such fortifications as are made wth earth, faggot, & tymber logges, to know how most speedely and to most aduantage to rayse a Sconce vpon any ground, how to entrench a Regiment to most aduantage: For as for making of trenches to approach a Town, or plant a batterie he is to be directed by the master of the Ordinance.

Finally he is to attend both on the Lord Marshall and Master of the Artillerie, to know from time to time where in they haue cause to imploy him.

CHAP. XIII. The Quarter-master.

This officer in our old English warres was called the Gentleman Harbinger, and is to haue vnder him (if the camp be great) diuers other Harbingers or Quarter-masters to allot the quarters and lodgings of euery Regiment and Band particularly.

He ought alwayes to geue his attendance on the Lord Marshall whēsoeuer he goeth to chōse the ground to place the Camp on, & carying with him a list of all the Regiments,
Cap-

Captaines & bands (which he ought to receaue frō the muster-master generall) he must according to the direction and commaundement of the Lord Marshall, take memorials how euery Regiment shalbe lodged, and accordingly afterward assigne them out their quarters.

This officer ought also to take care for the conuenient lodging of the chief Officers of the field, that attend on the Lord Generall, or for assignement of conuenient place for their Tentes.

This officer ought to know what quantitie of ground wilbe sufficient to receaue any Regiment of Horse and foote, allowing the such sufficiēt scope that they be not pestered: and yet not so great as thereby the Camp should be to much enlarged: For such quartering of Regiments in Villages farre distant one from another (as in Ciuill warres hath bene accustomed) is contrary to all true discipline Martiall, and would be their vtter confusion if they should meete with an Armie Royall that were able to obserue the auncient Romane Discipline of Encamping.

This Generall Quarter-master is onely to assigne the places for the entier Regiments, and then the Quarter-master of euery Regiment is within that circuite to li- mite conuenient place for euery band: and then the particular Harbingers of euery Bande to assigne the lodgings for the Officers and Souldiers of the Bande or places where they shall make their Cabins. But if there be any difference or contention about those lodgings, the Quarter-master Generall is to heare and decide the difference, and if nēde be to commit the partie offending to the Pro-uoost, till the Lord Marshall may further censure the punishment. This order duellie obserued, an Armie is accommodated sodainly without confusion. And without due obedience to these officers, great contentions, murders & mutinies many times arise, eue about these small matters

onely, if they be not well directed.

But in all matters of doubt this officer is to relie upon the order and commandement of the Lord Marshall, whose direction he is to follow & to see the same obserued: And whosoever he be Collonell, Captaine, or other person whatsoever that should presume to lodge himselfe in any other place, then where he is appointed or billeted by this officer, ought to be seuerely punished for Example.

These Quarter Masters were among the Romanes called Castrorum Metatores and the Quarter Master Generall Præfectus Castrorum, albeit some thinke that Præfectus Castrorum is rather our Lord Marshall.

CHAP. XV.

The office of the Scoute-master.

This Officer in the auncient Romane warres was neuer in vse: for they would neuer admit any watch without the Trenches of their Camp, but obserued this order, that every night one third part of the Armie remained armed, the other two thirds tooke their rest: And this armed part they diuided into foure quarters, and appointed to every watch of the night one quarter, which went and walked continually about the Trenches of the Camp, to heare and see if they could discerne any noyse, or stirring nigh y^e Camp: the other three quarters resting in the meane time armed in the place of assemblie. And when the first watch of the night was ended, they departed another quarter to the relief of the watch, & the quarter that had watched, returned to the place of Assembly. And thus they continued relieuing y^e watch til day. So that the enemy could neuer approach their Camp, but they found one third part in Armes, who were able to keepe them play till the rest had put themselves in order. But after their Militare Discipline grew to corruption, and that Souldiers neglecting honour and securitie would no longer abide the hardnesse
and

and seueritie of the Antique Discipline, they inuēted this kinde of forraine scoutē, that the paynes of a fewē might leaue the rest at ease. But what mischief hath and may thereby ensue, Histories will shew vs, and common reason may sone teach vs. But seing among many other corrupt customes of these our times, this is now also in all our Christian warres vsed, I will briefly shew his office, as among vs it is now a dayes accustomed.

The Scoute-master ought diligently to view and note round about the Camp, all the places of suspect where the enemies in the night time might approach, that he may accordingly afterward dispose of his Scoutes, and therfore he should attend vpon the High Marshall at such times as hee goeth to make choise of a meete platt to Encamp on: And then to speake his fancie touching the conuenience or inconuenience of the seate, in respect of due place for the Scoutes.

Also as soone as the Trompet soundeth to the watch at night he must immediatly repaire to the Lieutenant of the horsemen, requesting him to assigne him a competent number of Horsemen to attend vpon the Scoute that night, and then must hee geue them charge vpon paine of death none of them to abandon their places till the Discouersers be come into the field, and haue taken their places.

The best order for the placing of the watch that I haue noted, is this: first he shall set the ring watch round about the impalemēt of the Camp viz. a Bill, a Bow or Harquebuzē, and a Pike, and euery one a pike length from another: then without them certaine little Troupes, five or six in a troupe of footemen of different weapon viz. bowes, harquebuziers, pikemē, and short weapon, & these troupes alway to send forth a couple (whereof a harquebuzier alwayes to be one) and these to pry and harken what they can discerne. Againē without this foote scoutē other small troupes of horsemen, five or six in a companie, and these

likewise to disperse themselves abroad to discover what they can. And if they happen to see or heare any thing, presently to report the same to the soute scout, and one or two of the soute scoutes to repaire to the Scoute-master, who is (if it be matter of importance) to open the same presently to the High Marshall.

Besides all this, in time of suspect, it were requisite that a stand-watch be maintained within and about the ordinance: But because that appertaineth not to the charge of the Scoute-master I let it passe.

It is requisite in the long cold winter nights to relieue the watch five or six times, at the least in a night, the same more or lesse as y^e Scoute-master & other principall officers shall thinke meet for the better preservation of the people.

Also in the morning, so sone as the Trumpet soundeth the relief of the watch, he must repaire to the said Lieutenants Tent, there to receiue by his assignement a convenient number of horsemen to scoure that day, & then shall he geue order vnto some to ride to the highest hills, to view round about what they can espie, and other to the vallis and obscure passages, woodes, or such like, and to ride one from another a good distance: so as if one chaunce to be surpris'd by the enemy, yet the rest may escape and bring intelligence thereof: and so sone as the Scoute-master shall receaue any aduertisement by the Scourers, he shall forthwith repaire to the High Marshall, and informe him of euery particular.

We ought in placing of his night watches or Sētīnells, to vse great consideration, first in setting his little troupes or bodie of the watch in some places of strength, so as they may be able, when the enemy shall approach, to make resistance and defend themselves, till such tyme as the Camp may put themselves in Armes. And besides these troupes he shall geue order that two or three shall walke forth one way, and as many mo another, and if they happen to see any

any matches light, or heare any noyse, forthwith one to repaire to the body of the watch, and so to the Scoute-master, & the other to stay till they can more plainly perceiue what y^e matter is. And it shalbe alwayes good to match some Harquebuzes together with pikemē, aswell that they may be y^e better able to defend theselues, as also by discharge of their Harquebuze, to geue warning to the rest, if any one of them should happen to be surprisid by the enemy.

This officer ought to be both diligent & painfull, considering how great a charge dependeth vpon these Scoutes, no lesse then the preservation or destruction of the whole Cāp, and therefore he ought continually both day and night, either himselfe in person, or by some other of great trust in his absence, from time to time to peruse and examine the order and demeanour of these Scoutes and Scourers, geuing order for reformation of all that he shal finde amisse, & so soone as he shall receaue any intelligence, forthwith to aduertise the Lord High Marshall.

But in our late warres the Sergeant Maior placeth the bodies of the watch and Sentinels on foote, and the Scoute-master taketh charge onely of the horsemen vancurreurs.

The Romanes had their Discoverers called Scultatores, or Speculatores, and others called Cāpiductores which were the guides or Cōductors of their Army, by the most cōueniēt wayes and passages: But of any such peculiar officer permanent, I haue not read in the Romane stories.

CHAP. XVI.

The office of the Sergeant Maior

or Sergeant Generall.

This officer is also of reputation, and ought to be a mā of great courage, & well experierced, that he be not dismayed with the Terror of the enemyes presence, for the most part of all his actions are to be exploited euen in the face of the enemy.

He ought to be a man of lively spirite and quick inuention, that he may sodainly perceiue, and quickly conceiue the nature of the Scituation and order of the enemies array, altering and disposing accordingly of his owne.

He ought every day to repaire to the Lord High Marshall or the Collonell Generall, to receaue directiō in what sort their pleasure is the Armie that day shall march.

He ought to receaue from the Muster-master Generall a perfit Rolle of all the Bandes, and in euery bande what number of short weapon, what pikes, and what shot, and the same to haue alway about him, that if any want, he may admonish the Muster-master thereof, that either they may be supplied, or his Rolle reformed.

The Sergeant Maior (after he hath from the Marshall, or Lord Lieutenant Generall receaued instructiō in what sort the Battaile shall march, he must presently sort euery kinde of weapon by it selfe, and then draw them forth in Fiftes or Sixes, five, six or seue in a ranke, as the prescribed order shall require.

He ought so to place euery bande, that their Captaine may be with them, to direct and animate them: but this is impossible to be done in these our warres, where euery small band is diuided into seuerall weapons, so that the Captaine in time of seruice cannot accompany his owne band, contrary to all good order and discipline.

He ought when a day of seruice commeth, to go with the High Marshall to view the place where the Battaile shall be fought, and there to speake his opinion how the matter should be ordered, & that done, obediently to execute such directions as he shall receaue from his Superiours.

To this officer it appertaineth so to sort his Souldiers, that the best armed impale the rest, and that the face and flanks of your Battails be well armed with pikes, the Ensignes well garded with Halberds, the tayle enclosed with the Cariages, wings of shot on either side, and those wings

wings more or lesse according as the place is larger or straighter, stronger or weaker, on the one side or on the other. These wings represent the Flankers in Fortification, and ought as orderly to flanke and scowre befoze the face of the battaile, as Bulwarks do the Curtane of a Towne or Fort.

But whereas it hath bene among our men of warre a custome to haue the bodie of our Battailles, Halberdes, Billes, battleaxes, or such short weapons, and to impale them onely with certaine rankes of Pikes, I think that custome first grew for want of sufficient numbers of Pikes to make a solide battaile: for whosoever shall behold in the field two battailles, the one all massie throughout of Pikes, and the other of short weapon, onely impaled with certaine rankes of Pikes, shall finde even in the eye a marvellous difference, in such sort as a man would farre sooner chuse to charge, and hope to break the battaile impaled, then that which is massie with Pikes: and in truth these short weapons (vnlesse they were short swords and long shields after the Romane manner, are fitter to execute in a Chase, after the battaile is wone, then to decide the furie of a battaile, or abide the violent charge of Barbed Lances: and to draw them out from the heart of the battaile to pursue a chase, cannot be done without great disorder.

For mine owne opinion therefore I like best the massy battaile of Pikes, empaled with three or foure rankes of Muskietiers, who being alway able in any march to accompany these armed Pikes (associated with this kind of forcible shot,) may march on all grounds in despite of the furie of any horsebands. Neither would I haue more rankes of Muskietiers in this empalement, then their Pikes were able to couer and defend from the charge of Lances: for from any other shot on horsebacke, they will sufficiently defend themselves. And to the end they might

The Authors opinion for placing and vsing of muskietiers, different from common practise

Still keepe their places without disordering their array) close to the bodie of the battaile, and yet vse their peeces as much to annoy the Enemy, as if they were in the field loose or disbanded, I would haue them trained and taught to handle and vse their Muskets as insueth.

These Muskets are to be charged in two sorts, the first is with the bullet euen with his boze to be thrust in with the Scowring sticke full home to the powder, and not to rowle in of it selfe, as is accustomed, for so shall he reach both farther of, and shote more surely farre then with the lesser bullet that rolleth in alone: neither would I haue him to contend to charge ouer speedily but soundly, & to discharge his peece surely: and in this sort good marksmen will beate a troupe of horse or fote shrewdly, 16. or 20 scoze of: whereas our common shot, if they discharge not within an hundred pace, they wil wast their powder, and do little or no hurt at all to their Enemies.

The second manner of Charging of a Musket is by Carriage with a case of smaller shot, viz. 5. 6. or 7. Harquebuze or great Dagge shot to spoile horse or men nere at hand, but Muskets laden in this sort should not be discharged but within an hundred pace at the farthest of the Troupe they meane to spoile.

Hauiing therefore appointed this my massie battaile of Pikes to be in this sort impaled with 3 or foure rankes at the vtmost of Muskets, I would haue the two first or vtmost rankes well charged with the entier bullet, and the other inward ranke or rankes to be charged with this case shot.

And when the Enemies troupe (be it horse or fote) approacheth to charge vs, when they come within 12 or 16 scoze, the first ranke shal giue their volee, and presently deliuer their peece to the second ranke to charge againe, taking theirs that are readie charged, with the which they may giue another vollee befoze the troupe of their Enemies can possibly

possibly aduance 5 score nearer, and perhaps the first ready charged againe to put into their masters hands before the Enimies troupes can come within 8 score of vs, considering no troupes of horse will gallop or charge on the spur till they come within lesse then 8 score, for putting their horses out of bzeath and strength when they shal most need them. In this manner I would haue the second or third vtmost rankes play with them with the entire bullet, till they approach within 6 score or lesse, and the the last ranke or two rankes that are charged with case shot to deliuer their Muskets (so readie charged) to the former rankes to be bestowed on the enemy a little before, and at the verie ioyning, which will make a farre greater slaughter, being thus vsed, then twentie fold that shot as commonly they are ledde and directed in skirmishes and loose Encounters, where a man shall see a skirmish maintained thre or foure houres, and thousands of shot discharged, and scarcely thre men slaine.

I would also haue the Musketers taught to discharge kneeling on their right knee, as well that they may be the moze assured to strike the Troupe they shote at, and not to ouershote it, as also to be thereby the better protected and couered with the Pikes, and by that meanes also in case of necessitie, two ranks of muskets may deliuer their volce together (the foremost kneeling, and the other standing ouer their heads: but this I would haue seldom put in execution, for the great daunger thereof, if the souldiers be not verie perfectly trained. For in truth fire shot are not to be discharged but one ranke at once, and herein hath our auncient English shotte (I meane the long bowe) a great aduantage, ouer any kinde of fire shot: For if there be of them seuen, eight, or tenne Rankes, they may giue their whole volce together, and so volce after volce, in such sort, as if a Generall haue tenne thousand Bowes in the

A great ad-
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field well placed, they may in lesse than one quarter of an houre deliuer on the enimie at the ioyning of battailes ten boles, which is an hundred thousand shot, and bestow them all within the battails of their enimies: whereas if the Generall haue ten thousand fire shot, it is impossible for any Sergeant general to direct them, or any expert Captaines or other officers in the world to lead them, to be able in one quarter of an houre to bestow one entyre bolee within their Enimies battaile to any purpose to annoy them, or any way once discharge them, vnlesse they should as in May games, onely to make a great noise, discharge all at the Moone.

So that if I should place any weapon within the bodie of my battaile but Pikes onely, it should be long bowes, who may in deede when the Pikes are couched, play ouer their heads vpon their enimies faces w^out any danger to their fellowes, which no other shot in truth can wel do, but Bowes only. Albeit that famous souldier of this age *Monsieur de la Noue* be of opinion, that fire shot may be placed within a battaile of Pikes, and so trained as they may ouer the heads of their Pikes, bestow some shot on Launciers that in plaine ground shall charge them.

I know this opinion of mine being different from common custome will be of the common multitude of such men of warre as can b^owke nothing but their owne customs, not onely disliked, but derided, and contemned as they generally do all other true and right Partiall discipline that punisheth or discouereth their licentious abuses. But so the honorable graue and experienced right Partiall Commanders (of whom the number is not great) do allow thereof, (to whose Censure I dutifully submit the same) I smally force the multitude of ignorant persons, what they thinke or say, holding their dispraise for a speciall commendation, and their enuious barking, a speciall argument of vertue in the backbited.

He must also so order the forlorne hope in the front of his battell with new supplies, out of the winges, or from betweene the battayles, that the front of the Armed men be neuer left naked or vncovered, till the Muskitiers begin to play, or that both battels come so nigh as they be ready to ioyne and crosse their pikes, then may the shot retyze eyther to the winges, and so to the ordnance, or betweene the battayles to the Carriages.

If the Souldiers be rawe and vntrayned men, it may be tollerated, to put them into one mayne Square, well impaled with Pikes, and so commit it to one bzunt: But if the souldiers be trayned in such sort, that they can in fight both march forward if they pzeuayle, or retyze vpon advantage, and yet mayntayne perfittly their arrayes, then by no meanes commit the battel to one hazard of fortune, but after the old Romane maner, make 3. or 4. seuerall frontes, with conuenient spaces for the first to retyze and vnite himsele with the second, and both these, if occasion so require with the third. The shot hauing theyr conuenient lanes continually during the fight to discharge their peeces, which shall make an incredible spoyle of the enemye.

It is also the part of this Officer, in tyme of rest, when the enemye is absent, to cause the bandes to assemble and to put them in sondry sortes of standing and marching battels, to reduce them sometime into smal Squadrons of 400. or 900. in a battell more or lesse at his pleasure: and to cause these Battalions to march forward swiftly or slowly according to the stroke of the Drum, to stay and to retyze in perfite measure, no lesse assuredly, then men are taught to daunce by the sound of Muscicall instrumentes. And when they can perfittely do this, then cause them suddenly to make any Flanke a Front, or turne entirely together, as if it were one bodie, without breaking their array: And when they can do this, albeit they neuer

law the Enemie in the face, yet may they be termed trained Souldiers: and if they want this skill, albeit they haue bene in twentie battailes, and 20 yeares in the warres, I hold them raw souldiers and vnttrained Bands.

It is also a point of great cunning to make a Squadron march vpon one cozner, maintaining stil his square forme: And this and such like varieties in marching, albeit they be not in seruice so necessarie, yet do they bring the souldiers to a singular readinesse, and are farre better, and moze commendable pastimes, than Dicing and Carding, which the famous Romanes in their Campes would neuer tollerate.

We must consider the difference betwene marching and standing Battailes. And this is a generall Rule, that there is no Battaile meete to march, but onely the battaile that is square, or compound of Squares. All others as the Lunular, the Triangle, the Pentagonall and Hexagonal battailes, the Circular and Ouall, with infinite others that easily may be inuented, neuer serue to any vse, but onely in fired and immouable battails, for presently in marching they disorder.

These kind of immouable Battailes though of themselves they are smally seruiceable, considering in all Encounters continuall motion is required, and it is not possible to traine men to that perfection, as being ranged in such forme of Battaile, shall not presently in marching breake their array: yet for exercise of men, I hold it verie requisite that the Sergeant Maior both know how, and also often do put his souldiers into these fashions of Embattailing, causing the sodainly to change from Triangle to Square, from Circulare to Lunulare, and thereby bring them to such perfection in these vnnecessary hard cunning toyes, that the other plaine seruiceable formes may seeme most plaine and easie.

This officer ought besofehand to pmeditate and call
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in what sort with most facilitie he may bring his men to order of battaile, committing to the peculiar Sergeant of euerie band, the charge to draw them forth in Sleeues, and so cause one to march close by by another, till all the battailes be furnished, placing the Ensignes alway & Drums in the middle rankes of the battailes.

He had neuer take care to order his shot in any forme of Battaile, but only to put them into certaine Wings, and euerie Wing to be deuided into sundrie peitie troupes of twentie, or five and twentie men a pece, and euerie of these Troupes to haue a leader or Corporal. And to maintaine a skirmish, first one Corporall marcheth forth, and bringeth to the face of the Enimie his little Troupe, who presently disband, and discharging, retyze themselves: and in place of them, another Corporall with his company presents himselfe continuing this order of supply, till the first haue charged againe. And in this sort may they continually maintaine Skirmish without intermission. But the place being large, it shalbe requisite oftentimes to present many of these Troupes at once to the face of the Enimie, who hauing deliuered their volce of shot, shall march away as is before said, and others supply their place. And this kind of discharging and supplying, may verie well in the open fielde be maintained in the King march, so as the head shalbe sure alwayes to haue charged, before the taile haue discharged, And thus in a Circulare march, the skirmish all day continued.

In plaine grounds he should neuer turne out any shot to the skirmish, without certaine files of Pikes, to gard them vpon the retreat from the charge of Horses, and also certaine small troupes of short weapons, as swordes and Targets, Halberds, or such like, to backe them, if at any time they should come to the sword, or ioyne pell mell with their Enimies; and such (of the Romanes)

were called vindices. But if euerie shot had likewise at his backe a light Target to vse with his sword when he saw occasion, it were much the better.

A new Archerie.

Our English Bowes also to gal horse and footemen to, as commonly now a daies they come into the field armed, would be to singular good purpose, being a weapon of advantage, that scarcely any other Nation but our owne hath. But there is another kinde of Archerie that with Arrowes shalbe able to beat to y ground an whole troupe of horse halfe a mile distant and more, whereof in my Treatise of Fireworkes and great Artillerie more at large.

Item the Sergeant Maior by his office, is to appoint euerie Capitaine his place, some in the Front, some in the Rereward, some to leade shot in the wings, other to guide the Forlorne hope, and all these are accordingly to put in execution his order.

It is also in our late warres accustomed that the Sergeant Maior both in Campe and Townes should place and appoint the bodie of the Watch, called the Corps du Gardes, and to giue them order for placing also of their Sentinels, to appoint all the Rounders, and to giue them order in what sort they shall passe their Rounds single or crosse at his discretion.

This officer doth also vse to receiue the Watchword from the Lord Marshall or Lord Generall, and to giue it to the Sergeants, Corporals and Rounders, and when himselfe walketh the Round, then to receiue the word of the Sentinels and Corporals, and not to giue it.

He ought to be allowed certaine expert Gentlemen to attend alway vpon his person, for Corporals of the Field, to imploy this way or that way as occasion is offered, and these should be men of such perfection, as are able presently to conceiue, and liuely to expresse any thing that is vpon sodaines to be done, touching the changing of the arraes, or other seruice whatsoeuer.

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For the better executiō of these, and many other important Seruices, to this office appertaining, if the number of souldiers be great, it is very requisite that this officer haue knowledge in Arithmetick, whereby he may sodainly for all formes of Battailles, resoluē how many Rankes, and how many in a ranke to frame the Battailles, what number of Pikes, of Halberdes and shot shalbe requisite, how many Sleeues, Maniples, or Herfes euery Battaile may be resolved into, how many ranks of pikes in the front, or Trayne of those Herfes, and how many ranks of Halberds to guard the Ensigne. Also vpon sight of the ground, to consider, whether it be able to receaue such multitude of mē: Also what forme of embattailing may best agrē vnto it: In these & many other questions meete and necessary for the consideration of a Sergeant Maior, I haue before shewed how requisite Arithmetick is, whereby he may frame Tables also for ignorant Corporals that want Art to direct themselves.

Some souldiers haue a mystery that the numbers of & in their ranks must be alwayes odd and not euen, but it is a fond toy and ridiculous superstition.

Some vse to create two or three or mo Sergeants Generall, but one Sergeant Generall with diuerse Corporals is best: And in truth this officer among the Romanes needed not, for euery Collonell for his owne Bands was a Sergeant Maior, and for ordering of the whole, in the day of Battaile the Generall himselfe discharged it, and all inferiour officers knew so well their duties, that such officers would among them haue bene reputed meere superfluous. Albeit some thinke this officer among the Romanes was called Tessararius

CHAP. XVII.

This office of the Muster-master Generall or Comptroller of the Musters.

This officer is also in all Royall Armies most necessarie, aswel for mainteining of the forces complet, well armed, and trayned, as also for p̄uention of such fraudes as otherwise may excedingly wast the Princes treasure,

and extremely weaken the forces. He hath the oversight of all the Captaines and bandes, and ought to haue at the beginning deliuered vnto him by the Lord Generall perfitt Lists and Rolles of all the forces both horse and foote, officers, &c. with the rates of their allowance signed by the Lord Generall for his direction and discharge for signing of warrants for their full pay.

He ought to be acquainted with the discharge and alteration of all Officers and Captaines, and with the removing of bandes from garrison to garrison, deliuering warrants or letters to his Commissioners or Deputies in in euery garrison, to take muster or reuiew of them at their entrance into their new garrison.

He ought alwayes to haue in a readinesse perfitt Listes and Rolles of all the bandes in euery particular garrison, together with their numbers and strength for well arming, trayning &c. that he may be able at all tymes to informe the Lord Generall how the forces are placed, which bandes are complet, or weake, well armed, or contrary, to the end the strong may be drawne out to seruice as occasion shall require, and the weake relieved in convenient garrison: And therefore the Generall of musters is also by office alwayes of the Militare Counsell, being best furnished (of any other officer) to informe and by aduise to ayde the Lord Generall vpon such occasions.

His duetie is also to examine and call to accompt all the particular Muster-masters, or Commissioners of musters in severall garrisons. And if he finde abuses by them committed, to discharge them, or (for insufficiencie or negligence) to remoue them.

He is also to haue especiall regard (if he will haue the Prince well serued) not to suffer any of those his Commissioners or Deputies to be too long resident in any one garrison: For such is the corruption of Militare Discipline in this age, as these officers (doing their duties sincerely) shall

shall hardly continue in their garrisons without danger of life, but either for feare, affectiō or gayne they shall be induced to collusion or conniueance, which by alteration & changing of them from their garrisons, may both be discovered and prevented.

He is also to heare all differences that shall fall out betwene the Commisaries of musters and Captaines about the musters or allowance of souldiers absent by passport or otherwise: And such matters as himselfe *Ex Officio* cannot determine, to procure order from the Lord Generall. And albeit by former precedentes the Generall Muster-masters of English Armies haue also vsed by their owne conscience and discretion to qualifie and moderate the Captaines checks, yet, for mine owne opinion, I hold it more conuenient that this Officer truly and sincerely certifie the checke as he findes it: leauing the mitigation and qualifying therof to the Lord Generall, by whose discretion and conscience it seemeth to me most meete the same should be perfozmed: And the Captaines rather to bee bounde and beholding to the Lord Generall himselfe for fauour, then to any Officer of the Armie: which course my selfe alwayes obserued while I caried that office.

And whereas vpon quarterly accompts many doubtles and difficult pointes happen, which will require further tyme for indifferent resolution: and for that also it is impossible, notwithstanding the premises and what other most diligent and carefull meanes that may be vsed; but that error by some accident or other, to the detriment of the Prince or hinderance of the souldiery, may be committed, if the checkes should be so absolutely set downe at the first, as no correctiō might afterwards be vsed either for the benefite of the Prince (as some without reason would haue it) or relief of the Captaines or souldiers, as were most vnconscionable: The indifferentest course shall be that this

officer (after due censure and Comptrollement of matters questionable either found by examination, search and conference of the muster-rolles & other Accoꝛdes of his office, or presented by his said Deputies or intelligenzaries, doe crosse onely such checkes as by the Captaines and officers of the bandes, or such other as the same shall most directly concerne, shalbe agreed on: Respiting all further considerations doubtfull vntill the next accompts, that vpon thorough examination the same may be either crossed or discharged, as the pꝛoues in that behalfe shall fall out: Vnlesse it shall please the Lord Generall by his anthozitie for any speciall respects to remit the said respited checkes also, as was accustomed whilest I bare office in the Low Countries, and befoze both there and in other Services. The which orderly course of setting downe the certaine vndoubted checkes and referring all matters questionable vnresolved for want of indifferent time or any other sufficient cause: is assuredly the most indifferentest that may be, against the which none can with reason take exceptions, but such as (finding it sweetfishing in puled waters) would keepe all things in huddle and confusion to make their gayne thereby to the Princes great disadvantage. And as by this playne, certain, & liquide meanes of accompting, the Prince is greatly aduantaged in discouerie of fraudes and abuses: So shall the Captaines or Souldiery at any time be relieved vpon petition to the Generall, if any error haue happely bene committed.

To this office also it appertaineth to frame all the warrants for full pay of officers, Captaines and bands of Souldiers, making seuerall warrants for euery band: and these warrants being all drawne and examined, the checke should be entred with the Muster-master Generall his owne hand, and his hand also set to the fote of the warrant befoze he present the to the Lord Generall to signe.

This officer of all other, especially in this age (where
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in by reason of disordered licentious intestine warres, right Militare discipline is become so odious) ought to haue such contentment, allowance & entertainment both for himselfe & his Substitutes, as he may with reputation liue, & without regard of good or ill will of any, do his due, tie sincerely: wherein I must cōfesse my selfe had no cause to cōplaine, hauing during the whole time of my imployment in that office from the very beginning to the end of y^e Earle of Leicesters gouernement, and after so large and honozable allowance and enterteinement, with Commission so large and ample as any that euer serued in that place before me: and therefore if I had not faithfully discharged my duetie I must acknowledge my selfe woorthy of all blame and shame. And as this officer in his iust and byright proceedings ought to haue all countenance & backing against the confederacie of lucrous corrupt persons, so if he be found to abuse her Maiestie, or secretly to receaue of any Captaine or other, any byzibes, beneuolence, or present whatsoeuer, other then the ordinarie fee appertaining to his office: and that openly and of duetie, & not secretly by beneuolence or curtesie of any: I hold him woorthy of all seuerer punishment.

But bycause the well maneging of this Office may strengthen the forces, p^rserue the Treasure from bayne wasting, and aduance the seruice more then any other of the Armie: And the office of that nature, as (whether the companies be in Camp or dispersed in garrisons,) may not conueniently be spared, as other officers of the field, whose vse is onely or chiefly while the forces are in Camp: I thinke it not amisse to publish the very instructions and orders for musters established by the Earle of Leicester for gouernement of the English Armie while he was both Lord Generall for her Maiestie and Gouernour of the vniited Provinces, by their owne election: not onely ratified by his Lordship, but also viewed & allowed

by the Lordes of the Counsell in England, and after perused, examined and confirmed by the Counsell at warres and of Estate of those Prouinces : and last of all by authoritie of the States generall published in print : whereby many needefull particularities may be learned, y cannot be otherwise moze brievely exprest. But as there neuer were any Ordinances of Mustres moze oppugned by reason of the most disolute, licentious & disorderly courses & abuses practised befoze his Excellencies Gouvernement, which made all good Discipline seeme a bziidle vntollerable vnto them : So hauing receaued, examination, triall, and Ratification publique of so many graue Counsels and Militare Magistrates, there wil now be none found so impudent I thinke as to oppugne them.

Ordinances and instructions for the Muster-master and his Deputies for the better discharge of their duetie in that office : Decreed by the right Excellent the Earle of Leicester Lord Lieutenant and Capitaine Generall of all her Maiesties Armie and forces on this side the Seas, and Gouverneur Generall of all the Prouinces and Cities vnited in the said Lowe Countreis and their Associates, signed the first of Februarie.

1586.

Fo: as much as without good orders in the musters, as well her Maiesties Treasure may be vnduely payd and baynely wasted, as also the Bandes of Souldiers in the Armie and garrisons aswell by want of their due numbers as also of furniture and good trayning may bee greatly enfebled and weakened, it is therefore by his Excellencie ordained, That there shall monethly or at the furthest every two monethes be General

nerall musters taken of the Armie and the garrisons. And that the Muster-master shall in the Musters aswell take view of the defectes of the Armour, weapon and other furniture, as of the want of due numbers of the Souldiers. And also in what sort, and how well they are trayned, and exercised, that his Excellencie may aswell be informed of their defectes in trayning and furniture, as due Defalcations made of their pay for want of their due numbers.

That the Muster-master make choise of such place or places to Muster in the Campe or Garrisons, as shall be fittest for this service of her Maiestie: aswell to discover fraudes, as to auoyde confusion. And that every Capitaine cause his Band to be in a readinesse at such tymes and places to passe the Musters as by the Muster-master shall be appointed, vpon payne of imprisonment and losse of his charge at the discretion of his Excellencie. And that the Prouost Marshall shall also be there present for assistance, and for obseruation of good order, and punishment of the offendours.

That the Muster-master also in euery garrison Town where he taketh Musters, shall viewe the places of Exercise: And whether the buttres or markes for trayning of shot bee conueniently placed, and vpon any default to geue order, where, and in what maner the same should be reformed.

And for asmuch as it is a principall commendation in a souldier to haue all his armour and furniture in a readinesse, and deserueth seuerer punishment when negligently or wilfully he shall lose or want any part thereof: it is therefore also ordered by his Excellencie. That the Muster-master shall haue authoritie if he finde any souldier to want his armour or furniture at the muster day, to check him in his monethly paymēt halfe a crowne and his Capitaine a crowne. And the same halfe crowne to bestow on

some such other souldier of that band, as, for well keeping of his armour or furniture, and well using of his weapon shall be iudged by the chief Commaunder of the garrison & Muster-master best to deserue the same. And likewise for any of the shot that shall want their Purrians at any muster hereafter, the like penaltie shall be incurred. And if it fortune that any one souldier shall be found againe in like default, then his Excellencies pleasure is, that (beside the like checke and defalcation for pay) he either be disarmed and made a Prisoner, or some other way punished in such sort as the Governour of the garrison and Muster-master shall thinke conuenient.

5 That the Muster-master or his resident Deputies in euery garrison, shall by due inquirie made aswell at the guesthouses as at the other lodgings of the sicke souldiers from time to time learne the true dayes of their death and make true entries thereof in their booke accordingly, geuing notice thereof vnto the Captaines: And that no Captaine shall be allowed pay for any such sicke souldier, longer, then to the time of his death, entred in the booke of Entries as aforesaid, or otherwise certified vnder the hand of the Governour of the Garrison.

6 That euery Captaine vpon the changing, supplying & new entertaining of any souldier, shall presently geue notice thereof to the Muster-master or his resident Deputies in the garrison, or in their absence to the chief Commaunder of the garrison, to the end true Entry may be made of the day and due checkes of their pay: And that no Captaine shall be allowed pay for any such new entertained souldier, but onely from the time of such Entry.

7 That the Muster-master (before he make any warrants for pay) do circumspectly examine all the defects & checkes by himselfe and his Deputies taken, and accordingly to make the warrants for euery band with his hand thereunto, to be signed by his Excellencie, keeping a perfit Register

ster of all such warrants made by him as shalbe so signed, that at all times he may yeld due accounts of his doings. And that no thzough payments be made by the Treasurer, but by such especiall orderly warrants made as is aforesaid, according to the English Precedents alwayes heretofore vlsed: But that conuenient impress may be giuen to the Captaines in the meane time for reliefe of the souldiers when neede is, to be defaulked after vpon their full pay to be made vpon the warrants aforesaid. And that such Impresses passe by warrants vnder his Excellencies hand.

And it is farther ordered by his Excellencie, that in all places fronting on the Enimie, the Mustermaster shall haue for him and his company sufficient conueigh from one garrison towne to another, as well for their owne sauetie, as for the guard of such Treasure as shalbe sent to pay the souldiers.

R. L.

Articles of Instruction prescribed by Thomas Digges Esquire, Mustermaster generall of all her Maiesties forces in the Low Countries, to his inferior Substitutes and Commissaries of all Garrisons, perused by the Lords of Her Maiesties Councell in England, and ratified not onely by the Earle of Leicester then her Maiesties Lord Generall, but also after great debate, examination, and mature consideration, allowed by the Militare Councel of Estate of those vnited Prouinces. And last of all by authoritie of the States generall, and his Excellencie their Governour published in Print, in English Dutch, and French, and by Proclamation together with other Articles of their owne also, commanded to be inuolably obserued.

You shal giue notice vnto y^e Captaines of al Bands vnder your charge, that they may not change, receiue, &
 W iij

No alteration without the Commissioners knowledge.

discharge souldiers at their own pleasures, but must both in receiuing and discharging present the souldiers to the Commissioner of Musters resident, that he may giue the souldier his Oath. And also that the true day of his Entrie, or discharge, may be truly entered accordingly in your Muster bookes: And that such discharge or alteration be done also by the consent and liking of the Gouvernour or chiefe Commander of the garrison, or else such new souldiers are not to be allowed in pay, but from and after such orderly Entry & Oath giue as is aforesaid: And after the souldier is sworn, and his name entred, ye shall deliuer a Billet of your hand to the Captaine to admit him.

Defect of Arms checked.

We must also giue notice vnto the Captaines, that they present their souldiers Armed and furnished at the Musters, according to the qualitie of the weapon wherewith they are enrolled: And that for euery 100. souldiers they are to maintain at leaste 12 musketiers, or els to be checked in their Bands for defects of Armour also according to the ordinances by his Excellencie to the Muster master generall deliuered.

Entrie of dead & run-aways.

We must also let the Captaines know if any of the souldiers dye, run away, or depart from his Ensigne without license of the chiefe commander of the garrison, that he bying good prouise of the day of such death or departure of the souldier, that he may accordingly make true entrance thereof, or else he is to be Checked for his souldiers pay from the Precedent muster.

Defect of Armes at watch &c. checked.

We shall also admonish the Captaines, that the souldiers come armed to their watch & ward, not wanting any part of their furniture, and also do duely obserue their dayes of exercise & trainings, according to such Ordinances as shall be deliuered from his Excellencie, or the chiefe commander in their garrison, vpon paine of such checks, as by the Muster-master general shall be set on the, vpon your certificate at the next musters, according to such ordinances as al-

redy

redy are, o2 hereafter shalbe established by his Excellency.

We are to admonish the Captaines, that they suffer no souldier o2 officer of theirs to depart out of their garrison, o2 place of charge without due license. For as much as Musters hereafter shalbe taken on the sodain, the gates of the Towne closed, and none absent admitted pay, without lawfull Pasport o2 License.

No absence
without Li-
cense.

If any difference fall out betwene the Captaine, & his souldiers, about their pay, by any abuse in the Clarkes of their Bands, o2 otherwise: ye are plainly and truly to deliuer a Note vnto the souldier of the time of his Entrance, and Pay due vnto him for his Continuance. And if y^e Captaine by your mediation wil not accordingly content him, ye are to aduertise the same to such superio2 officers, as Iustice be done according to the Ordinances by his Excellencie established in that behalfe.

Differences
betwene
Captaine &
Souldier.

We are to admonish the Captaines, that in making their Mulster books, they are to name their Corporals as wel as their Officers, & their gentlemen also with euery weapon, viz. Musketiers, Pikes, Halberds, & shot, seuerally by themselves, because her Maiestie allowes dead payes for such extrao2dinarie Officers & charges: and that (for vniformitie sake) they place fīue names (onely) on euery side of the Leaues of their bookes.

The order of
the booke of
Musters.

We are also for euery souldier y^e shall die o2 passe away by Pasport, to make true entrance in your Books of y^e day of his death o2 departure, & deliuer y^e Captain o2 Clarke y^e shall bzing the Pasport, a Billet vnder your hand for Testimonial thereof, in such manner as is hereafter limited.

For the Co-
missarie to
billet.

If any band by Potent be removed from your garrison to any other, ye must send with the Captaine o2 chiefe officer of that band, a perfitte Copie of your Muster role, vntill that day, to be deliuered to the Commissarie resident in the other garrison. And likewise when any new band shalbe sent into your garrison, he must receiue a perfitte

What course
Commissa-
ries must
keepe vpon
change of
Garrison.

What course
Comissaries
must keepe
vpon change
of garrison.

Copie of their muster roll from the Commissarie of the other Garrison: And hauing called them by name in presence of the Captaine, or other chiefe officer, ye may set your hand to the Rol, acknowledging the truth thereof also vnder your hand or billet, as is hereafter limited for that purpose.

The ordering of a band
of 160.

We shall also giue the Captaines notice that they must keepe for euerie 100 souldiers, foure Gentlemen, and two Corporals at xii d the day pay a peece at least, besides 12. Muskietiers at x d the day pay a peece, & xxxvi. armed pikes in euery hundred. And because ordinary shot haue now 10 gildernes the moneth a peece, that were wont to haue but 8. his Excellencies pleasure is that one Gilder a moneth of euerie shot, shalbe bestowed on him in powder to serue for his dayes of trayning and exercise, besides his watch. And his Excellencies farther pleasure is, that these Corporals in euery band shalbe monethly changed, & new chosen by consent of the Company, or greater number of them.

Powder for
training.

This point
was suspended and not
put in execution.

Item euery Captaine presenting his souldier to Muster without his furniture complete, shalbe checked for euery such Souldier mustered, the ordinary Rate or price of such weapon or part of his furniture as he shall so want.

Check for
want of furniture.

Warrant
bookes or
booke of alteration, with
the order.

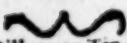
We shall euerie three monethes receiue from the Captaine, y^e musterbookes orderly made, according to the Precedents deliuered vnto you, expressing the true dayes of Entrie and departure of euerie particular souldier, the which you must duely examine as wel by your billets, as by your other secrete meanes, and then set downe euerie particular souldiers due vpon the margine of his name, casting by euerie lease, and so the whole booke according to your Precedents: and these bookes finished, & subscribed both by your hand, and the Clarke of the band, vpon Oath, to be sent to the Mustermaster general, to be then examined by the seuerall musters and conference of the Rolles:

And

And Warrants after due controlment by him made, to be signed by the L. General for full pay to a day certain.

Precedens of Billets for receiuing and discharging of Souldiers, to be deliuered by the Commissioners of Musters resident, vnto the Captains.

To Captaine A.B. one of the Captains in her Maie ties paye now resident in the Garrison of C. &c.


Billets, or Tickets of

These shall testifie that D.E. hath taken his oath, and is this tenth of September 1587. admitted and entred into your band. Witnesse my hand.

Entrie.

These shall testifie that D.E. your souldier, being orderly discharged this tenth of Nouember, is accordingly entred in my musterbooke. Witnes my hand.

Discharge.

These shall testifie that D.E. your souldier, being dead, or runne away without licence, this fifth of March 1587. as hath been orderly approued, is accordingly entred in my muster rolles. Witnes my hand.

Dead.
Run away.

These shall testifie that D.E. your souldier, hauing passport bearing date the 18. of June 1588. to return before the eight of Nouember next ensuing, is accordingly entred in my muster roll. Witnes my hand.

Passport.

These shall testifie that I haue receiued from the Commissarie, resident of the garrison of F.G. the muster roll of Captaine H.I. whose band is entered into this garrison of L. this present fifth of April, 88. Witnes my hand.

A band entred into a new garrison.

The oath to be ministred vnto all Officers, Captains and Souldiers, vpon their entrie into pay, as also at Musters.

We doe sweare and promise to doe all loyall, true, and faithfull seruice vnto the Queen of England

her most Excellent Maiestie, and vnto the Prouinces and Cities vnited in these countreies, and their Associates, vnder the charge and obedience of the right Excellent, the Earle of Leycester, Gouvernour generall of y^e said Prouinces and Cities, and their Associates, and of her Maiesties Armie and Forces within the same. And all lawfull and due obedience vnto the said Gouvernour, and to any other superiour that shall haue charge vnder him for gouernment in this Armie. And further we doe promise, to endeavour our selues to keepe and fulfil all such lawfull Ordinances as his Excellencie hath, or shall set forth and establishe, for the better ordering of this Armie, as much as concernes vs so long as we shall serue vnder him. So helpe vs God by Iesus Christ.

Tho. Digges.

Resolutions taken by his Excellencie vpon the redresse of the Musters, as well of the men in pay of her Maiestie, as of the countrey.

First that from hence forth the Commissaries of the musters shall keepe their firme residence respectiue, in the towne and places which shall be vnto them appointed, except three or foure Commissaries of these countries, which shall followe the Court to goe and execute their charge wheresoeuer they shall be commanded, and to this end so farre as shall concerne the musteringes of the men in wages and pay of her Maiestie, the Muster-master Generall of the Englishmen, shall nominate nine Commissaries on his part at her Maiesties charge, the which shall haue Patentes or Commissions from his Excellencie, for the perfozmance of their office vnder the said Generall. And there shall be also committed and appointed on the behalfe and in the pay of the countrey nine other Commissaries with like Patents, to the end that two and two together

gither at the place to them appointed, may take musters of the men of warre in her sayd Maieslies pay. And if the said men of warr are in more then nine places of Garrison, then shall the number of the commissaries be augmented on the one side, and the other accordingly.

In like sorte shall there be other Commissaries of the country committed as by his Excellencie, according to the repartition or proportion of the townes or places, where ordinary garrison lyeth, shalbe thought convenient to be payd by the country, and those also to keep firme residence in the sayd places.

And the said Commissaries shall euery of them in their distinct quarter or garrison, haue full power, authoritie and commandement dewly, and on the sodaine to take the Musters of the Garrisons and men of warre, being in the places comprehended in their commissions respectiue, ly. And that so often and whensoever they shall thinke good or that by his Excellencie or the Counsell of State, they shalbe commanded at least euery moneth once: and to like purpose they shall extraordinarily employ themselves where they may chance to be sent: provided that the day and hower to muster the men (being in pay of her Maieslie) shalbe appointed by the Commissarie of this country, and that to take away all diffidences: but if in anie Muster made at thinsance of the commissarie of the country, the sayd Mustermaster Generall shoulde doubt of any abuse or fault, either in passing the company stronger then the same is or other, it shalbe lawful for the said Generall and his committies, hauing speciall charge from him to appoint another day and hower to take a newe Muster on the sodaine. And if there be any difference in the sayd Musters, the said Generall shall aduertise it to his Excellencie, & the Counsaile of State to ordaine there,

bypon (after the parties heard) as shalbe thought convenient.

And if the English Commissarie appointed as aforesaid by the Mustermaster Generall, being dewly certified of the intended muster, shall refuse or delay to assist at the sayd musters, or that he be not there when it is needefull to take the same, then he that is ready and present shall be bound to procede to his charge, being lawfull for him to take the said musters or reuietw, & the Captaines shall be bound to obey therein: provided alwaies that he shalbe bound to deliuer copie of the rolles of such musters signed vnder his hand, vnto his adioinct or fellow Commissarie that assisted not, or was absent, and bypon his sayd fellowes returne, or at any time being required or commanded.

The said Commissaries shall be bound to governe themselves aswell according to the instructions, pointes and articles, set downe in the behalfe of her Maiestie about the said musters, concerning the order to be observed for the day of entrance and departure of souldiers, with the order of the decountes and reckonings agreeable to the same, for somuch as toucheth the Englishmen of warre in pay of her maiestie, as also according to the instructions made by his Excellencie.

For somuch as toucheth the maner and forme of the said musters, and the pointes thereof: so to make the better with the fraudes which by experience are found, haue bene committed to the great disseruice of her Maiestie and the Country, and both the said instructions of her Maiestie and his Excellencie with the Placcart and the present resolutions shall be deliuered to the said Commissaries of the musters, with warning in ech respect to follow the same,
except

except in those points which by his Excellencie shall be iudged to repugne the articles of her Maiestie, sozsomuch as toucheth the men in her pay.

Except that in place where her Maiesties instructions containe and appoint, that enery thre monethes the Captaines should deliuer their bookes of Musters to the end &c. It is found moze easie and conuenient by his Excellencie that decountes shall be made enery moneth by the ordinarie Commissaries, and vppon euerie muster roll which shalbe taken, and that then presently the sayd rolles with the decountes shall be sent, so well to the chamber of Thresorie of this Countrey as to the sayd Generall Mustermaster, signed by both the Commissaries, to the end the same may be examined and corrected as they shall finde conuenient: and afterwardes the warrantes to be therebpon made by the said Generall of the Musters or by them, or him that by his Excellencie shalbe thought good to appoint to that end. And to the end the said Commissaries may haue a certaine course or forme, whereby to make the sayd decountes there shalbe deliuered vnto them a perfect list signed by his Excellencie of the intertainments of the English companies in her Maiesties pay, which rule they shall obserue. In like sort shalbe deliuered to the Commissaries, hauing charge of the men in pay of the countrie a perfect Liste of the intertainmentes of such Companies: provided that the Commissaries of these Countries, shall not make anie other decount soz the said Souldiers, at the charges of the countrey then soz one monethes wages, and that also with the liking of the Chamber of the Treforie where they shalbe bound, euerie time to send the rolles with the decounts as aforesaid.

As soz the instructions made on the part of the pro-
x. ii.

uinces where it is said, to passe no pay neither for the Sergeantes maiors neyther vnder other pretext: his Excellencie is resolved that the meaning of the article concerneth the Sergeant maiors, which receiue intertainement ordinarily: but for the others which haue no ordinary treatement which shall be passed vpon eche company at the countries charge, one pay at ech payment which shall be made to the Garrison to their charge committed.

When any paiment shalbe made or appointed for the Guarrison to them committed or among some company in particular, the Captaines shall not make the distribution of the said payment, but in presence of the sayd Commissaries whereof they shall once for all giue knowledge to the Captaines, and shall doe all indeuour to the end also some one of the Magistrates do assist to be the more assured that the sayd souldiers receiue their wages allowed to them by the rolle: also the better to know the said souldiers and obserue if there be no Passeuolants passed, which receiue small or no wages: to the end they may in such case doe as they shall finde conuenient. And if any Captains make refusall to distribute the pay in their presence, then shall they aduertise presently his Excellencie thereof to be remedied.

That they shall alwaies haue good regard to the marching vnto the watch and the Corps de guardes by night, besides shalbe bound and authorized often to visite them and number the souldiers they shall finde at the watche, and if they finde anie fault in their last rolles shall demand the reason thereof of the Captaines.

That such Commissaries which shalbe thought fitte to serue the place of Sergeant Maioz, beside the place of Commissarie of the musters, in the place of their residence, shalbe

shalbe bound being thereto required to accept their sayde charge, and discharge it faithfully, wherby they shal likewise haue better meanes to know the souldiers being vnder their charge, and according to the same, meet with the abuses which are committed.

That they shal in like sort intertain god and mutuall correspondence and friendship with their Chieftes and Captaines, hauing charge and garrison at the place of their residence, reseruing alwayes their othe and credite in so much as toucheth their charge and office.

The sayd Commissaries aswell in the behalfe of her Maiestie as of the Countrey, shall take othe before the Counsel of State, to acquite themselves faithfully in their charge according to his Instructions, Placcarts, Lists, and resolutions which shalbe giuen them from his Excellencie, and of the Counsell of State.

Resolved and done in the Counsell of State, the 28. of September 1587. was parapheed I. Teelinck, and signed R. Leicestre, and vnder the same by ordinance of his Excellenci.

Ch. Huygens.

Translated and collacioned out of th'originall being in French, and found to agree in substance, verbatim.

Per me Gilpin.

These Resolutions albeit they were but badly translated, yet because they were thus printed in the low countries, I haue deliuered them verbatim without alteration.

The oth by the states established for all
captaines in their pay to take at passing
of musters.

WE sweare and promise that all the Persons and names which we present in the roll by vs deliuered, be Souldiers in standing and actual seruice of our companie, watching and warding euery one in his degree. And that they are bound to follow the companie euery where, and there whither the same may be sent. Also that we haue not borrowed nor taken any Souldiers in seruice, or set them in the roll, but those which haue had absolute and due Pasport of their captains, or otherwise haue bene free. And finally that in no sort, directly or indirectly we pretend by this muster to defraud his Excellencie the country, or anie other body.

And if the Captain, Licutenant, or Clark (notwithstanding the sayd othe) be found in fault, his Excellencie commandes the Commissaries hauing found the fault, after the othe giuen and taken, to aduertise him of the same, to be punished as Periurers according to their merite.

This Officer is not to be commaunded by any but the L. Generall, whose warrant only must be his direction in al cases concerning his seruice: and was among the Romanes called Censor, where his authoritie was so great, as of himselfe he had power to punish many offences, and to casse, disgrace and discharge very great persons for their misdemeaners.

CHAP. XVIII.

The office of the Treasurer at warres, or
Treasurer of the Armie.

This is also an Officer of reputation, and ought to be a iust man himselfe, and also to make good choyse of honest

honest men for his inferior Pagadozes, or paymasters: seeing otherwise both Captaines and Souldiers may be many wayes wronged, the treasure vnduely wasted, the credite of the Princes pay empayzed, and dangerous mutinies on the sodain rayled.

He ought to be as carefull as the Generall Mustermaster, that fraudes (tending to the vndue waisting of her Maiesties treasure) might be punished. And as hee ought not to disburse or impzeest any treasure, without good warrant from the L. Generall, so ought he also (before he make payment) to informe the L. Generall if he see any needeles warrants, procured for superfluous issuing of the treasure.

His interteinment also ought to be suche, as he should haue no neede to vse any collusion, or confederacie with Marchants, Victuallers, or any other, to make extraordiinarie gaines. And to geue such intertainment also to his inferior officers, as they should not need (by buying of Captains or Marchants billes) to make indirect gaynes, but rather to be the meanes to right all extremities, or wrongs betwene Captains and creditozs or souldiers, wherein he may winne great reputation: his office being of that nature, as by iust and vpriight dealing he may win great loue, and doe great good in the armie: and as much mischief by the contrarie.

Neither is it conuenient for this Officer to haue a band or charge of his owne. For the office of Treasurer alone (if he doe his duetie) requires an whole man. And by experience it is found, that this Officer shalbe thereby enforced to wink at such faults in other Captains, as he would seuerely otherwise seeke to reforme, if the same did not concerne his owne frehold.

He ought monethly, or quarterly at farthest, to make perfect booke of his actompts, setting down seuerally for euery Captain or officer of the armie particularly their

Impzesses and collaterall defalcations: how, when, for what, and to whom payd. And the same to be so clærely and plainly set downe, as there be neither secreete cunning, double charge, nor obscure conueyance: for, *Veritas non recusat Lucem.*

If he see great Persons by fauour get from the L. Generall warrants to be full payd, or ouerpayd, when there by many other inferiour Captains, Officers or Souldiers shal want much of their due, he ought to make the same knowen to the Generall, without regard of offence, or any other priuate benefite. For such partialitie in payment extremely græueth and woundeth valiant and honest mindes, that labour by desert and not by flatterie to gett aduancement.

He ought also to haue alwaies in readines perfect Abbreviates of the treasure receiued and expended, that the L. Generall at all times may presently know the remain and state of the treasure, payments, and debts, in time to procure new Supply, as occasion shal require.

Where no Auditor is established, the Treasurer is to receiue from the Victualers and Munition-masters, the Tickets of all stoe deliuered to the Captains and Souldiers, to defaulte the same vpon their warrants of full pay, taking acquittances from the Captains, particularly expzessing euery defalcation, & also the remaine in readie money receiued by the Captain.

But where an Auditor is established, there it is his charge to see all defalcations vpon full pay deducted, and to deliuer his *Debentur* to the Captain for the residue, and the Treasurer to keepe those *Debenturs* for his discharge.

And indeed it is very inconuenient to annere his office to the Treasurer, considering how infinitely he may gain by allowance or disallowance of Billes, even to the overthrow and ruine of an Armie. And therefore I will also adioyne certaine brieve notes of that office & Officer, and
cf

of the abuses committed, & to be committed, almost without possibilitie to be discouered or remedied, if that Officer be not establiſhed with ſuch conuenient entertainment, as he ſhal not for neceſſitie be inforced to confederate, or be conuiuent at theſe abuses inſuing.

This Officer among the Romanes was called Quaſtor, & is not to be commanded by any other but the Generall only: and yet is to haue good regard to all ſuch Caucats as he ſhall receiue from the Muſter-maſter Generall, and Auditor. And if he doe any thing to the contrary, that may hinder or preiudice her Maieſties ſervice, he is to anſwere it at his perill.

The Auditors office.

There are two ſorts of Auditors, the one for criminall cauſes, and are commonly ioyned in the Spaniſh gouernment as Aſſiſtants to the Camp-maſters for miniſtring of iuſtice by lawes Partiall. But the Auditor I meane in this place, is the Officer for accounts: which among the Spaniards is alſo called Auditore: and without him the Treaſurer or Pagadoze (as they call him) makes no payments.

This Auditor muſt receiue from the Muſtermaſter Generall, a Liſte of all the Captains both horſe and foot, that are in the Armie, with the times of their entrie and diſcharge: & likewise of all the great Officers of the field, & of the Garrifon townes: and to haue faire and large bookes, leauing a leaf or two for euery ſeuerall Captain and Officer to enter their Impreſtes, Defalcations, Billes of debt for Munition, Armes, Victuals, or other neceſſaries.

If the General at any time graunt a warrat of Impreſt to any Captain for money, to prouide neceſſaries for his Copany, or to any Officer in part of his wages, he ought firſt to enter it with ſaid Auditor, & to haue ſaid Auditors hand to ſaid foot of his Bill, to ſhew it is entred: and without ſuch warrat from ſaid General certified by ſaid Auditor, the Treasu-

rer ought not to issue any peny of her Maiesties treasure.

This Auditor ought monethly, or quarterly at farthest to cast by his accounts, that he may on any sodain let the General know what treasure is issued, what remaines in the Treasurers hand, and what wants to make full pay to any day certaine.

This Auditor also, if any particular souldier shal bying his Captains bill of debt to haue it entred, or for order to haue it defaulted on his Captains warrant for full pay, he ought first to conferre with the Muster-master, to see how long he hath serued, and whether it be likely to be a true bill of debt, *bona fide* made, or els by collusion, onely to draw out treasure vnduely. For these & many mo fine cunnings are vled to draw out such treasure to priuate vles: so as thereby many times there remaineth nothing to pay the souldier that by true service hath best deserued.

And albeit it be the office of the Mustermaster generall to collect and censure the checks, & to make out the particular warrants for al officers, & captaines ful payes, setting his hand to the foot of the warrant, befoze the L. Generall signe the same. Yet is it also conuenient that the Auditor examine the summes, whether they be truely entered: and to the totall, at the side of the warrant also, to set his hand befoze the Generall signe it.

These two Officers therefore, that haue no fingring of the Queenes treasure, ought to haue good correspondence, and familiar conference for discouerie of fraudes, & reliefe of poore Souldiers. But for either of them to be ouer familiar with the Treasurer at warres, or any other Pagadoes whatsoeuer, it is very suspicious.

This Officer was neuer so necessarie as in these late disordered warres, where abuse and corruption is growne to such a finenesse, as no Officer (meete for discouerie & controulment of fraudes) should be neglected. And to the ende the vble of this Officer and his duetie may the better be knownen

known, I think it not unfit to deliuer a few notes of Abuses, (too common in these our modern warres) no way to be redressed, but by good choice of expert, able, sincere Officers, to discharge the places of Mustermaster General and Auditor, who are indeede the only bzidles of corruptions, and the chiefe or only meanes to redresse and remedy the same. But considering how mortally they shalbe hated of all lucrous Officers and Captains (whereof the numbers in these dayes are to great) it is fit they be both countenanced with authoritie: and also haue such competent entertainments, as they may without feare, or respect of any, doe their dueties faithfully.

This Officer among the Romanes was called Tabellarius, he kept the reckonings & accounts of the whole army.

CHAP. XIX.

The office of the Master of the Ordinance.

This Officer being one of the principall Officers of the field, hauing the charge of the Artillerie and Munition, ought to be a man of great learning and experience. His Experience shall make him ready to conceiue and exploite many particular actions, wherein a very good witte without trayning, shal stagger & be amazed. Learned he ought to be in Histories, to consider of manifold Stratagems that by other noble souldiers haue heretofore bene vsed: the sundrie sorts of Engins to assault and defend: of Bridges to passe waters, and other ingenious inuentions for conueying of great Ordinance ouer Marshes. But especially he ought to haue exquisit knowledge in the Mathematics, considering thereby he shal be able certainly to shoote at all Randons, to couey Mines vnder the earth to any Curtaine, Bulwarke, or other place that he determineth by violence of powder to rent in partes: to supputate and forecast what quantitie of shot, powder, &c. shalbe requisite for any Battery or other exploit: To set

out in due proportion every particular Fortification, Campe, Towne, or Fort, where Ordinance is to be used, which cannot possibly without knowledge in these Sciences be sufficiently discharged. And that Maister of the Ordinance, that is ignorant herein himself, & trusteth the skill of others, shall be abused by audacious presumptuous persons, that taking upon them the knowledge they utterly want, will shame themselves, dishonour him, and foyle the Enterprize.

He ought immediatly upon the receipt of his charge to cause an Inuentory to be made of every fetherall thing, as well to render account thereof, as also to consider whether he haue sufficiēt of every sort of Munition to serue & turn.

To this Officer appertaineth a Lieuetenant, and certain Clarke in wages, who are to attend inferiour causes, rendering accompt of all their doinges to the Maister of the Ordinance.

To this Officer it appertaineth to foresee, & from time to time to prouide, that there be store inough for all kinde of necessaries to the Artillery appertaining, as Wheeles for Ordinance, Axeltrees, Ladles, Spunges, Bullets, Chayne-shot, Crosse-barres, Corne-powder, and Serpentine-powder, Mattocks, Sholues, Crowes of Iron, Hand-axes, Engines for the mounting of Ordinance, grand Mawnds or Gabbions, litle Handbaskets, Ropes & al other Cartware.

Item, to haue such Gunners, as are not onely skilfull in the readie managing of their peeces, but also in the making of Truncks, Balles, Arrowes, and all other sortes of Wild-fire, and for the continuall supply of the, they ought to haue in readinesse great store of Sulphure, Salt-peter, Rosin, Calxuiue, Lintfeede-oyle, and common Lamp-oyle, Pitch, Tarre, Camphire, Wax, Turia, Arsenick, Quick-silver, and Aqua vita. Hereof let them frame Balles of fire to burn in the water, Cressets and Torches that stormes or windes cannot extinguish, murdering Bullets to be shot out

out of great mortar peeces, and such like.

Item, that euerie peece of Ordinance haue his conuenient number of Hozle or Dren to drawe the same, and Carters also to guide and keepe those beastes.

Item that euery peece haue his Gunner or two to attend theron, to charge, discharge, & mount the peece, also to wadde and ramme, to cleanse, scoure, and coole the peeces when they are ouer-heated: And for this purpose they shal haue in readinesse sponges, vineger, and colde water, &c. and for these Gunners there should be one maister Gunner to ouersee them all.

Item that if any band in the Campe want powder or shot, the maister of the Ordinance, vpon request of the Captaine, is to giue order that his Clarkes deliuer the same, taking a bill of the Captaines hand for their discharge, the which bill must at the pay day be deliuered to the Treasurer or Auditor who is to stop so much vpon the pay of that Captaine and his band.

To this Officer it also appertaineth to haue in readinesse certain boates made for the purpose with flat couers of square plancks, which chained together may make so dainly a Bridge to passe an Army ouer any water. He ought not to be disfurnished of Cables & Ankers to let fall in any swift or violent streame, to hold the said Bridge.

The Maister of the Ordinance is alwaies to haue attending vpon his charge a sufficient Band for the Garde of the Artillery, and also Pioners to make ready the way for his Carriages, and to entrench the place in the Campe that shalbe (by the Prouost marshall) assigned for y^e Munition.

Item that there be of Wheele-writes, Carpenters, Coopers, Smythes, Bowyers, Fletchers, masons, and such other skilfull Artizanes, with all tooles necessarie and needfull, to preserue, repaire, and make all such thinges as to the Artillery and munition appertaineth.

In the Field, whensoever any day of Seruice is, it is
the

the office of h maister of the Ordinance, to select a conuenient place to plant his Ordinance, as well to annoy the Enemy, as also to be in such sozt garded and fortified that it be not surprized of the Enemy.

Item in the Campe, he onely ought to giue order for the planting of the Artillerie, & Fortification of the Flankers. And that the Ordinance be planted to the best aduantage, and also to foresee that the Maister Gunner & other Gunners doe their duties which doe appertaine to their office.

Item in the besieging of any Towne or Fort he onely ought to dispose and giue order for the planting of Artillerie, to make the Batterie, and to foresee that they be well fenced with Gabbions and Rampiers of earth, and so placed, that the Curtain may with most speed and least charge be battered and ruinate.

Item that al such peeces as are vpon anie Mount within the Towne planted to the annoiance of h Camp, may be dismounted, & the Flankers cut off before assault be giuen.

Item if there be anie possibilitie to approach to h Towne by Myne, the Maister of the Ordinance onely ought to giue order for the accomplishing of the same. And the Captaine of the Miners and Pioners is to follow his Direction.

Finally, this Office is of great Reputation in the Field, and the execution and employting of great seruices dependeth therevpon. But because it is neither possible nor convenient that the Maister of the Ordinance should attend al these thinges himselfe, he may commit inferiour causes to the execution of his Lieutenant, reseruing alwaies to himselfe the disposition of the great and most important.

I Might here adioyne sundrie Tables and Collections of all sorts of Artillery, what Bullets, Wadders, Rammers, Ladles, Leuers, & Barrells of powder, what Wheels, Axeltrees, Chains, Cord, & al other arming and furniture for carriages, to euery kind were conuenient to be had in readinesse, what oxen & horse to draw them, Pioners, Carters, and Gunners to attend them,

Instru-

Instruments and Art to mount them, Gabbrions to defend and guard them, with sundrie Receites and Compositions of Trunks, arrowes, Bals, Barrells, & other Engines of fireworks &c. both for offence & defence. But hauing in my Treatise of Pyrotechny and great Artillery prepared at large to handle euerie of these particularly, and to supply the wants of this office fully: Meaning in this Treatise but generally to touch & giue a tast onely in each degree of our wants and imperfections, that our Nation may not alwayes rest drowned in this ignorance, and secure dreame of Antique valure, while all our neighbors round about vs Arme, Traine, and Fortifie. Till I may haue time to finish that Treatise, I leaue farther continuance of this matter.

Of the Master Gunner.

The Master gunner is but an vnder officer appertaining to the master of the Ordinance: And his office is to see all the inferiour Gunners to do their dueties, to be skilfull and readie in their charging, discharging, cooling, leuelling, and mounting of the Ordinance: and to haue in readinesse Bullets and Powder, Ladles and Spunges, to wadde, ramme, cole and charge the peeces, Also to peruse the Carriages and wheeles, that they be stronge, and the Peeces themselves, that they haue no Honycombes, or flaws in them, whereby they should be in daunger of breaking. To haue in store Crosse barres, Chaine shot, Cases of Haile shot in manner of Cartages, Trunckes, and Balles of Wildfire, with artificiall Barrells of pebble stones charged wth powder to throw into Ditches, or to defend a Breach vpon any sodaine attempt. These and such like are matters for the Master gunner to occupie himselfe in, and to make proofes of them in presence of the master of the Ordinance, that he may see the effect and violence of them.

These officers among the Romanes were not, because Ordinance is newly inuented and to them unknowne, but instead of Artillery, they had Arietes, Scorpions, Balistas, & Arcubalistas. They had also Testudines, Turre, and such like engines, which in besieging of Townes and other Seruices, they used. But all these are now out of use, and serue indeede to small purpose. The force of ordinance being such, as the Fortifications of Townes in these daies is cleane contrarie to that of the Antiquity, & Romane Præcedents therein can nothing pleasure vs.

CHAP. XX.

The office of the Collonell Generall of the Footemen.

This Officer in great and Royal Armies, where there are many severall Regiments, Collonels, or Campe masters, is very necessarie to reconcile and accorde all differences, and to take care of the Infanterie, as the General of the Horse should do of the Cauallery.

He is to receiue from the Muster master generall a List not onely of all the Captaines, but also of euery band particularly, how strong they are in Pikes, Shot, and Short weapon: And this List or Copie thereof he is to deliuer or ner vnto the Sergeant generall, with commandement to him to call the Captaines together, to examine them whether they haue so many able bodies for seruice in þ field, or if they alledge some to be sicke &c. as alwayes they will, then vpon their Credites euery one to deliuer his number of seruiceable weapons.

He is also to cause the Sergeant maior to call all the Bands and Companies into the field, and in their Marches first to see whether they haue deliuered true notes of their strength, or if he finde difference to alter and amend his List or Notes, and severely to rebuke or rather punish such a Captaine as should dare to present an vntrue note.

For

For if they they thinke it so great a shame to receive the Lye in any trifling matter, what shame and punishment deserve they that will Lye indeede, and that to their Collonell generall, and that in a matter of so great importance.

After that by these double and treble trials the Collonell generall hath gotten a true List of all his forces, he hath a good ground to procede vpon for the ordering and imbattailing of them in any formes he shall finde conuenient, either in respect of the scituation of the place, or in regarde of the Enimie they are to Encounter.

And to the end he may the better trie the skill and dexteritie both of the Sergeant generall, the Corporals of the Field, and also of euerie Campe masters Collonels and Captaines, It shall be verie good before they haue occasion to deale with the Enimie, sundrie times to draw them to the field, and to prescribe vnto the Sergeant generall what forme of battaile or Battailes he will haue them divided into, how impaled or fixued with Pikes, how many Fronts, how many Battalions, how placed, and in what sort one shall succour another. And it shall be good for him to resoluie with himselfe on two severall and different sortes of Embattailing, deliuering the one ouernight to the Sergeant generall, and the other to keepe to himselfe secret: And then the next day when the Sergeant generall hath raunged them into the first forme, to commaunde them to disbande and March away, and then on the sodaine to deliuer vnto the Sergeant general and the Corporals of the field the other Plat, commanding them according to that second Direction to embattaile them &c.

And hereby shall he make a full triall of his Sergeant generall, Collonels and Captaines of their readinesse, dexteritie, skill and habilitie in Souldiers craft: For

upon a nightes premeditation the next day to put men readily into any prescribed order of Battaile, is euerie mans case of any meane experience. But thus on the so, daine to do it speedely, readily, and without confusion, Hoc opus, hic labor est. This requires experience and Art also.

It shall be conuenient also for him by mutuall accord with the Lord marshall or Lieutenant generall of the Horse to haue some charges offered both with Launces and Petronels, & then the pickmen taught how to couch their Pickes to receiue the charge, and presently to aduance againe and march away, to retire or to charge as they shall bee directed. Also in what sort they should line their Pikes with Muskets, and those Muskets how they should discharge on their knee vnder the gard of their pikes, and readily charge agayne, &c. As in the office and questions Arithmetically concerning the office of the Sergeant maior hath bene at large declared.

Likewise for light armed Pikes and loose shot to succour their owne hoysmen, and retire in safety with the greatest annoyance of their pursuing enemy, briefly to shew them all varietie of seruice, and what they haue to do vpon any accident that may befall, for these are right Militare and honozable Exercises that make all officers skilfull and the souldiers bolde and courageous, desiring nothing moze then to do that in earnest they haue practised in pleasure.

To this officer also it appertaineth euerie night to set downe the ordinances for the March of all the Infanterie, which Regiments shall haue the Vaward, which the Battaile, and which the Rereward: but the same must be presented by him to the Lord Marshall, whose Censure also in all matters doubtful he is to abide as well as the Lieutenant of the Horse for the disposition of the Horse Bannes.

When

When any Captaines or Collonels of footemen or other Officers are slaine, this Officer is to recommend such as he knoweth to be the ablest and fittest persons, and out of those the Generall to choose who shall succede.

This Officer also hath authoritie to imprison or comit any Captaine or Officer of the fanterie that serueth vnder him, but not to casse them or to bestow their Companies without the priuitie and consent of the Lord Generall.

This Officer is not commaundod by any other of the Armie, but onely by the Lord Generall himselfe or Lord Marshall. He is sometimes allowed his Lieutenant, but in truth other Lieutenant then the Sergeant Generall he need none, neither hath his Lieutenant any thing in the world to do, that ought not to be discharged by the Sergeant Generall: and therefore may be accounted among the needlesse and superfluous Officers.

This Officer ought not onely to haue very good skill in all those matters that are before rehearsed in the office of the Sergeant Maior, but also in all Marshall Lawes (which hereafter in the Office of the Lord Marshall shall be set downe:) because he is a chief Counsellour in the Marshall Court or Counsell, where he is to deliuer his minde, and in all cases concerning the Infanterie especiall regard is to be had to his opinion.

There are no Sciences moze necessarie for this Officer then Arithmetike and Geometrie, at least so much of either of them as may enable him in matters of fortification, and also for Embattailing of Souldiers in sundry seruiceable Militare formes, that he may not onely be able to Judge of the sufficiencie of other men in their offices vnder him, but also where they are ignorant, to giue them Directions: which shall not onely greatly encrease his honor and reputation, but also those inferiour officers seeing the valure and skill of their Coronell Generall, will by all meanes endeavour to encrease their owne knowledge: and

audacious ignozant persons will not dare or presume to offer themselves to serue in Offices they are not in deede able to discharge: whē they know the Collonell Generall is not onely able to discerne their wants, but to refozme all himselſe. And contrariwise where these chief Officers are ignozant they are alwayes suted with like inferiour Officers, and so all things procéde in confusion.

CHAP. XXI.

The Office of the Lieutenant General of the Horsemen.

This Officer hath vnder his charge all sorts of Horsemen, as well the light Horsemen and Demilances, as the Men at Armes, and Barbed Horses, seruing to breake into a Battallion of Pikes, or to backe the other Horsemen being repulſed. And albeit I meane not in this place particularly to entreate of the ſeuerall charges of euery Captaine of light Horsemen Demilances, and men at armes, yet thus much I thought good to note, that a Captaine of an hundred men at Armes may be compared with a Collonell of footemen, & other Captaines of light Horsemen, with the Captaines of footemen, subiect to the Collonell. And as it is the part of the Collonell to haue a speciall regard to the arming, lodging, and trayning of his footemen: so is it the duetie of the Captaine of mē at Armes, to foresee, that neither they be disfurnished of their Horse and Armoz, with other necessaries, ne yet vntrayned in al such Militare exercise as to their profession is agreeable. And this Lieutenant is to ouerse the actiōs of these Captaines, and to giue order in what sort, in what place and time they shall exercise their Bādes.

He ought immediatly after his entring into charge, frō the Multer-master Generall to haue a Rowle of all the Bādes cōmitted to his gouernement, with the names of their Captaines, & the to peruse their furniture, if it be good,
to

to allow thereof, otherwise to make the High Marshall & Generall priue of the default, that it may be amended.

He shal giue order to y^e Captaines vnder his charge, y^e frō time to time their aduertise him of their defaultes, either of men, horse, or armour, that he may prouide for supply.

He must dispose his severall sorts of Horsemen in severall troupes, the Barbed Horse by themselves, Demilances by themselves, & of his light Horsemen, the Harquebuziers in a severall troupe from the rest. And herein I can compare this Officer with the Sergeant Maior, bycause he is to receiue his direction from the Generall, or High Marshall, euen as he doth, and then according to the order resolved on, to dispose of these Bandes.

He is to appoint which Bands of Horse shall go to the watch or scourage, & must accordingly prouide, that they which watch the night, may rest the next day & night, & others that haue rested, supply their places, in such sort, that fresh men may alwayes be employed in the seruices, and the wearied to take their rest, for neither Man nor Horse without their conuenient rest can continue any long time.

Also so soone as y^e Trumpet shall sound in the morning to make ready the Horse, he shall forthwith repaire to his Generals Tent to know his pleasure, & then immediatly to set forth his Generals Standerd, & cause all the Horsemen forthwith to repaire to that place, and as euery Captaine shall come, he shall cause them to put their bands euery one after his Standerd or Guidon, into a certaine number of Ranks, that the said Lieutenant may readily at euery souldaine draw forth any number of any sort of horsemen that he shall be required by the Generall or High Marshall.

The Lieutenant ought in the morning, to giue notice to such horsemen as he intendeth shall watch y^e night ensuing, to the end they may feede & spare their Horses that day, & also rest themselves, that they may y^e better be able to do such seruice as they shall the night following be enioyned.

When the High Marshall goeth to view the groundes to encamp vpon, it is the Lieutenants duetie to select a conuenient Band to attend vpon his person, & to appoint such a Companie, as may afterward take their rest, & feede their Hozles, till such time as he shall deliuer them to the Scoute-master at night, who the shall enioyne them what to doe all the night after, and shall also deliuer them their Watch-word.

This Lieutenant ought all the day, whiles the Battailles march, diligently to note the orders of euery Band, & if he see any disorder, forthwith to send for the Captaine, and cause him immediately to see it redressed. Also at night when the Armie entreteth into the Camp, the Lieutenant shall still cause the Hozsemen to keepe the field, till all the Footemen be encamped, the may he enter with his Bands of hozle orderly, causing first one Band to enter, & all the rest keepe the field, and when they haue their conuenient place, then another Band to enter, and so orderly to place themselves. Wherein the Lieutenant is to foresee that the last Bands be not worst lodged, but such conuenient place left as they haue no iust cause to complaine.

He ought also to giue order that the Scourers come not out of the field, till the Trumpet sounde to the Watch at night, nor then neither, till such time as they shal perceiue the Scoute or Sentinell to be come from the Camp, and to haue take their places in the field: Then may they returne into the Camp.

He ought also to assigne a sufficient number of Hozle to attend on the Forrage-master, to garde and defend the Forragers, which Hozsemē must not come out of the field, till all the Forragers be returned to the Camp with the Forrage-master. Then shall these Hozsemen rest, and not Watch neither that night, nor Scoure all the next day.

He is also to appoint a reasonable Conuey of Hozsemē, for the safetie of such as bying victuals to the Camp, to see that

that no violence or iniurie be offered vnto them, and so order the chaunge of his Horse in these seuerall services, that some be not ouer burthened, and others ouer-spared, but the matter so indifferently vsed, that men haue no cause of murmuring or repyning.

In making of Rodes with Horsesmen onely, he should first send out light Horsesmen, Argoletiers, and such like to discover the Enemy: then to diuide his Launces into diuers Squadrons, and one of them to follow another a good distance. Of euery side of these massie Squadrons should be a pretie distance from them one ranke of Argoletiers. In this sort if one Squadron happen to be broken, yet shal another make head vpon the Enemy while they may retire and Troupe againe: which is the onely safetie as wel of Horsesmen as ffootemen.

And albeit in the day of seruice, it is the part of the High Marshall himselfe to giue order in what sort, & with what Troupes the Charges shall be giuen or receiued: it is also the Lieutenants part, as well to giue his aduise, as also to be a Leader in all these Actions.

He ought therefore to take great regarde to the ground where he meaneth to giue the Charge, for if he charge in Troupe, the falling of a few Horse in the foremost rankes may disorder and foyle the whole Troupe.

He must not giue charge before the Fronte of his owne Footmen, for it hath bene sene that Horsesmen being repulsed, haue bene forced in vpon their owne ffootmen, and disordered them. Let the Horse therefore charge vpon the Flanke of the enemy, and diligently attend if by any accident they can perceiue any breaking or opening in the side of his enemies Battaile, and then sodenly to charge that breach: for as Horsesmen shall finally preuaile vpon ffootmen well ordered, so vpon any small disorder, they carry with them certaine victorie.

I like wel the maner of y^e Germaines, who keep alwayes

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their maine Troupe standing, & cause onely one ranke frō the Front to charge, & the same being repulſed to retire to the tayle of the ſtanding Troupe, & then another to charge & retire to the Tayle, as the former, whereby they maintaine the whole Troupe in full ſtrength, till they ſee the footemen ſway or breake, and that their Horſemen enter.

Then preſently they backe them with an other ranke, and thoſe againe with another, till they ſee cauſe either to follow with the whole Troupe, or to ſtay. And this is the ſureſt and moſt orderly forme of charging of all others. Albeit ſometimes alſo the Ruyters uſe to wheele about with their whole Troupe, and euery ranke one after another to giue the Enemy a vollie of their Piſtols.

For execution of Juſtice on ſuch as are offenders in any Bandes of Horſemen, albeit in ſome Countries it be uſed that euery Captaine of an hundred men at Armes may call vnto him certaine of the chief of his Band, & heare and determine all cauſes, and offences by any of his Band committed, yet ſurely I hold it moze conuenient, that all matters concerning life, be heard by the High Marshall, who may cauſe to ſit with him the ſayd Captaine whoſe ſouldiour is to be adiudged, and ſuch other of the ſayd Bande as to him ſhall ſeeme meete, and the ſouldier condemned to death, to be executed by the ſayd Band, euen as the footemen are: and by the ſame kinde of weapons that the offenders uſed.

This Officer or rather the Generall of the Horſe among the Romaines, was called *Magiſter Equitum*, or *Præſectus Equitum*, he had the charge both of the Barbed horſes, called *Cataphractos*, & alſo of the light Horſemen, which they named *Expeditos Incurſores*. His office was not onely in the field to ſee his Captaines vnder him to doe their duetie, but alſo in the Camp to trayne their Bandes in all Militare exerciſe and Actiuitie.

Of the Lord High Marshall in the
Field or Camp.

The Office of the High Marshall is of great importance, and hath the direction of the greatest, and most important matters in a Camp. To him apperteineth the true administration of Iustice, the hearing & determining of controuersies, and the punishing of disorders. And therefore as he ought of himselfe to be a man both graue, wise, learned, & thoroughly well experienced in Martiall affaires, so is it also conuenient for him to haue about him men of iudgement, skillfull in Militaire Discipline, and lawes of a Campe, readily to resolute of euery Question, according to Equitie and Iustice.

Further, this is to be noted, that the particular Lawes of any Prouince, ought not to bind the Souldier in y^e field, but euery Campe ought by prudent consideration of the Generall, and his Counsell, to haue lawes set downe & decreed, yea, & the same to be published by open Proclamation, that all the Camp may haue notice thereof.

Some thinke it necessarie also, that not onely euery Captaine & Collonell should be swozne to the said Lawes, but after y^e old Romane maner euery particular Souldier at his entring into pay to take his Oth. For y^e which cause, the Romane warfare was termed *Militia Sacrata*.

The High Marshall so sone as he hath receaued of the Generall the names and numbers of all the Bandes of Horsemen and Footemen that are in the Armie, he must learnedly proportion and cast what scope of ground will suffice to encamp them, with all their Prouision, Carriages, Munition. &c. wherein he ought to obserue such a discrete meane, that neither for want of due room the Souldiers be pestered, nor by ouerlarge space, the Campe not sufficiently Fortified. ↵

This being one of the most important matters that the High Marshall hath to consider of, it shall be requisite for him to haue knowledge in Geometrie and Arithmeticke, and to haue in readinesse sundrie Plattes, Models, & formes of Campes, whereby he shall sodainely resolue for any number of Scituation, what forme and quantitie of Camp is most conuenient, and presently stake it out, assigning due place for euery Regiment of Footemen & Horsemen, Carriages, Ordnance, Munition, and euery particularitie, as hereafter shall more plainly be declared.

When the Armie shall remoue, the High Marshall must first giue order to the Master of the Ordnance, that he set forth the Artillerie, with all the Carriages, Munition &c. then the Master of the Victualles, and Carriages afterwards.

Afterward he must giue order to the Sergeant Maior, in what sort he will haue the Battaile to march that day.

Item, he must giue order to the Scoute-master which way he shall send his Vancoueurs to discover, if all be cleare, who must from time to time giue intelligence what Occurrents he discovereth.

The High Marshall must assigne euery Battaile his Guide or two, to conduct them the best and most easie wayes.

Item, he must appoint some conuenient number of Pioners to attend vpon the Ordnance to cleare the wayes for them.

The High Marshall when he goeth to view the ground where he intendeth to Encamp, may by his authoritie take such number of Horsemen, as he shall thinke conuenient, & then is he to consider, that there be nigh at hand Wood, Water, and Forrage inough for the Armie. And if he intend long to lodge in that place, then must he make his Camp the larger, and prouidently consider that euery Regiment haue his conuenient place. That the Tentes be not pitched

pitched nigh the Ring of the Campe. That there be large places of Assemblie within the Camp. That it be wel Entrenched and Fortified, whereof I will moze particularly speake in the Description of a Campe.

For lodging of Hozsemē, especially in a running Camp, it is not amisse to imitate the Ruiters, who commonly alwayes lodge in such Closes, as they finde environed with trees, or quickset hedges and ditches, placing their Horses in due order round about the fielde, two paces one from another, with Rayles betwēne them, leaving all the void ground in the middle for the Captaines Tentes, and Cabins for the Hozsemen.

The Ruyters manner of Lodging.



In this sort in a field of two or thre acres, I haue seenē a two hundred Ruyters verie commodiously lodged, with Rayles or Poles betwēne their Horses, & Boughes about them, to defend them from the wind. Some with Hales

ouer them, to keepe them from the raine, their Saddles, Bridles, and al other their Furniture hanging vpon Poles readie by them; neatly kept, and blacked, their Mangers also befoze them. For al such necessities the Ruiters carrie with them in their Carriages, besides, little Whelebarrowes to carrie away their dung, so that their Campe is no lesse cleane and orderly, than a Princes Stable. A faire strate they alway leaue betwene their owne Cabbins, and their Horses.

They haue certaine Troupes of their Seruants, whom they call their Knights, and these Troupes alway attend, that so soone as the Marshall hath limited their Quarters, they depart immediately to the next Woods for Poles, Boughes, Stakes, & other necessities, to build their Campe, Stables and Cabbins. Other go for Forradge, that befoze the Armie appoach, their Lodgings are alwayes in readinesse. To euerie twelue Ruyters commonly, there is allowed a Wagon with foure Horse, or to fire, a Cart with two Horse: and their Knights are about one third part of the number of their Horsemen.

The Lance Knights also encampe alwayes in the field verie strongly, two or thre to a Cabbonet, their Pikes and Armour standing vp by them in readinesse, and so orderly placed with strates so conuenient and cleanly preserued, that their Campe is no lesse holsome than strong.

I haue seene aboue 3000 of these *Lance knights* lodged in three or foure acres of ground, which *Proportion* differeth not much from that of the old *Romanes*.

The High Marshall, as wel for the ordering of Scoutes as al other matters of importance in the Campe, is to giue order, & at the setting of the Watch his Trumpets ought first to sound, and then all the residue of the Trumpets in order to answer euery one in his seuerall Quarter. And in the morning all the Trumpets should assemble befoze
the

the Lord Lieutenant Generals Tent, & there to sound the reliefe of the Watch: But no man vpon pain of death must remoue from his charge til the Warders be come out: then may euery man depart to his rest.

We ought to giue order, that such as come to victual the Campe be well vsed, and truely paid, & that vpon Victual some reasonable price be seized: and that such a place be assigned for the Butcherie, as annoy not the rest of the Campe.

Item, in the field at a day of seruice though there be a General of the Horsemen, yet it is the place of the High Marshall to serue there as chiefe, and to appoint into how many Troupes the Horsemen shall diuide themselues, and which shall Charge, and which stand for their Rescue.

Item, if any Prisoners be taken in the field, they ought forthwith to be Enrolled in the Marshals booke, and then if any man make claime to any other mans Prisoner, the Marshall as Iudge to determine who shall haue him, and for euery Prisoner brought into the Martialsea, and enrolled in the Marshals Booke, his fee is 8.s.

We is also to haue of all Booties taken in the field and brought into the Campe the third part: But aswel for this, as other his fees, they are by the General to be limited at the beginning, as shal be thought reasonable.

Finally, the High Marshall ought to be a man of such perfection, that he know the duty of euery inferiour officer, and be able to refoyme their misdoeds, and that of his own knowledge.

We should make choice of a good Prouost, to whom he may commit the handling of smaller matters, alwayes retaining the greater causes, and such as concerne Life, to be heard by himselfe: And for his greater reputation, & to be knowne from other Officers, he should haue in the field bozne before him a Cornet.

And forasmuch as to this Officer chiefly the execution of

Militare Lawes appertaineth, I will briefly here adioyne such Offences, as by law of Armes are to be punished with Death: For other that are not so hainous, the Marshal may by imprisonment, or otherwise at his owne discretion chastise.

Offences to be punished with paine of death in euerie Campe or Armie.

First, whosoever comitteth or conspireth any Treason against the Generall: Or giueth any aid to his Enemies: Or useth any conference with the Enemie without expresse licence from the Lieutenant generall, or one of the Lieutenants of the Horse or Foote Campe.

Item, whosoever shal discover any matter of Counsel, whereby any inconuenience may ensue: Or shall send any letter to the Enemie without leane of those Lieutenants: Or shal receiue any important Intelligence, & doth conceale it from the Generall to any ill intent.

Item, whosoever shal flie from one Campe to another: Or being taken of the Enmy shall not escape when he may: provided alwayes that after he hath giuen his faith to be true Prisoner, it shal be lawfull for him to obserue it.

Whosoever shall Traiterously or Cowardly render vp any Towne, Fort, or other place committed to his charge, being found by due triall, that it might haue bene kept.

Whosoever shall breake any truce with the Enemies: Or shall lay any violent hands vpon any Officer his superiour, vlesse it be for defence of himselfe, his life being in apparant perill.

Whosoever shall kill his Souldier vpon malice without iust cause: Or kill any other of the Campe, otherwise than in his owne defence.

Whosoever shall go about to make any Mutinie: Or shall disobey the sounds of Trumpet or Drumme in time of seruice,

rice, especially when they are made upon paine of Death.

Whosoever shall forcibly abuse any woman: Or take any spoile without leaue: Or enroll himselfe in two Bandes: Or passe twice in one Muster: Or part from Band to Band without licence of the chiefe Officers: For the Captaines haue no authoritie to giue such leaue.

Whosoever shall not follow his Ensigne: Or abandon the place he is assigned, whether it be in Field or Watch: Or shall sleepe in the Scoute: Or shall reueale the Watchword to the Enemy.

Whosoever being placed in Watch, Scoute, or other place of importance, so behaueth himselfe, that by his default the Campe is sodainly without notice assaulted: Or being appointed to the keeping or defending of the Trenche, or Breache, and shall abandon the same.

Whosoever shall spoile any Victualler or other person out of the Campe, being not of them that are declared Enimies: Or shall play away his Horlle or Armour, wherewith he is inrolled: Or flying away shall loose the same: Or any other way by his owne default shall be of that his Armour disurnished.

Whosoever quarrelleth with any Souldier placed in watch, or other places of importaunce: Or runneth to any quarrell with any other Armour or Weapon than his Sword: Or being thrise commanded to cease, and departeth not.

Whosoever retireth not immediatly upon the sound of the Retreat, maketh noise when Silence is commanded: Or passeth ouer any Wall or Rampire forbidden: Or lodgeth any stranger in his Tent without leaue from the chiefe Officer: Or fainteth himselfe sicke when he is commanded to the Battel, or other important seruice: Or absenteth himselfe wilfully from the Militare exercises.

For al other inferiour faults, as Dicing, Carding, Rayling Slandering, Quarrelling, beastly using themselues within the Campe, and such like, the Prouost Marshal is to punish them

who should haue Tipstaues attending on him, presently to apprehend such disordered persons, and to carrie them to Ward.

The Maister of the Pioners, the Trench & Mine Maister, are Officers wholly depending on the High Marshal, and are not to doe anie thing of themselves, but onely to see that their companies and people, committed to their charge, haue their Furniture in good order, and doe the worke they shall be inioyned diligently. But of themselves without Warrant these Officers can doe nothing.

I Finde not among the ancient *Romaines* any Officer vnder the *Generall* of so great reputation as this Lord Marshall nowe is, for albeit they had *Præfectum castrorum* & *Metatores castrorum*, which in some sort may be cōpared with the *Marshall* and his *Prouost*, in respect that they made choyce of the ground to encampe the Armie on, and also distributed the *Quarters* and *Regiments*, yet were they in dignitie inferiour. And this Officer was first deuised (as I iudge) to supply the imperfection and ignorance of the *Generals*, and after continued for their ease to disburden them of those *Cares*, wherein the *Romane Generals* tooke greatest *Fœlicie*. And were then no lesse iealous that anie inferiour person should participate with them of those honourable trauels, then *Generals* are now desirous to disburden themselves of all cares and paines. And although together with the Ruine of the *Romane Monarchie*, *Militare Discipline* in *Europe* for these thousand yeeres hath bene in effect quite extinguished, yet some worthe persons in all ages haue sought somewhat to reuiue the same: As may appeare by the *Prince of Conde*, and *Admirall of France*, whose *Discipline* for their *Campe*, together with our *English* and the *Spanish* discipline also, I haue thought good here to adioyne, because it somewhat fauoureth of the *Antique Romaine*.

Lawes

Lawes and Ordinances Militarie, set downe
and established by the right Excellent, *Robert Earle of*
Leicester, Baron of Denbigh, Iustice of Oyer and Termini-
er of her Maiesties Forrestes, Chases and Parkes on this
side Trent, Master of the Horse to the *Queenes* most Ex-
cellent *Maiestie*, one of the Lordes of her Maiesties most
honourable priuie Counsell, Knight of both most hono-
rable Orders, of the Garter, and Saint *Michael*, her High-
nesse Lieutenant, and Captaine *Generall* of her Maiesties
Armie and Forces in the Lowe Countries, and Gouver-
nour *Generall* of all the Prouinces, and Cities vnited
in the said Lowe Countries, and their
Associates.

*To be obserued by all such as shall serue in her Maie-
sties Armie vnder him in the saide
Countries.*

First Imprinted at Leyden by Andriers Verschont,
the five and twentie day of Ianuarie, 1586
De Stilo nouo.

Foasmuch as there is not any Estate, which in peace
or warre can be accounted sure, or preserved from dis-
honour and ruine, vnlesse it be supported & bozne by
Justice duely administred, and Discipline orderly obser-
ued. And so that no man can be so ignorant, as not to
know that Honor, Fame, & Prosperitie, doe duely follow
that Common-wealth or Nation, wherein good lawes
are established: the Magistrate ministring Justice is due-
ly regarded, and the people fearing to offend, are drawen
vnder the rules of Justice and Obedience. And seeing that
Partiall Discipline aboue all things (proper to men of
B b ij

warre) is by vs at this time most to be followed, aswel for the aduancement of Gods glozie, as honourably to gouerne this Armie in good order. And lest that the euill inclined (pleading simplicitie) should couer any wicked fact by ignorance: therefore these martiall ordinances & lawes following, are established and published, where by all good mindes, endeouoring to attaine honour, may stand armed, and receiue encouragement to perseuere in well doing, and such as are enclined to lewdnes, be warned from committing offences punishable. Which being embzaced with carefull respect, and followed with obetience, doe promise good order and agreement amongst our selues, with victorie, and good euent against our enemies.

Blasphemers

1 First, forasmuch as the holy name of our most mightie and inuincible God, with all reuerence ought to be regarded, and that destruction is pronounced to such as blaspheme or abuse the same: It is therfore ordeyned and commanded, that no person whatsoeuer, either in common conference or communication, or for any cause whatsoever, shal blaspheme, or take his name in vaine, vpon pain of losse of five shillings to the reliefe of the poore, for the first offence: for the second five daies imprisonment: for the third, losse of his place and wages.

Diuine seruice.

2 And because the continuall, and vnspeakeable fauours of our Almighty God, by our vnthankfulness may be taken from vs, and that no good euent of any action can be expected, wherein God is not first and principally honoured and serued. It is therefore especially ordeyned and commanded, that all persons whatsoever, shal vpon generall warning geuen either by sound of Trumpet or Drumme, repaire to the place appointed, where the diuine seruice is to be vsed, there to heare the same read and preached, vnlesse for the present by sickness

or other seruice he be impeached, vpon paine to lose his dayes wages for the first, two dayes wages for the second, and so to be increased by the discretion of the Judge, and for euery such default in the Souldier, as well the Captaine as his inferiour Officers, to be punished with like penaltie.

3 And seeing it wel becometh al Christians especially such as profess Military seruice, to passe away the time in matters requisite for their professiō. And because no time can be more vainly spent, then that which is consumed in vnlawfull games, beside the breeding of much contention and quarrels: and for that there be many allowable and commendable exercises for all sorts of men to vse, therefore it is streitly commanded, that no priuate souldier, or inferiour officer shall play at Dice and Cardes, nor any other vnlawfull games, vpon paine of two dayes imprisonment for the first time, and for after committing the like, to be further punished by the Judges discretion.

Vnlawfull
games.

4 And for that it often hapneth, that by permitting of many vagarant and idle women in an armie, sundry disorders and horrible abuses are committed, therefore it is ordeyned, that no man shall carry into the field, or deteine with him in the place of his garrison, any woman whatsoeuer, other then such as is knowen to be his lawfull wife, or such other women to tend the sicke, and to serue for Lauanders, as shall be thought meete by the Marshall, vpon paine of whipping and banishment.

Vagarant
women.

5 And in so much as clemencie amongst men of warre in some respects is a singular vertue, it is ordeyned, that no man in any part of this seruice that he shall doe, shall lay violent handes vpon any woman with childe, or lying in child-bed, olde persons, widdowes, young virgins, or babes, without especiall order from the Magistrate, vpon paine of death.

Wome with
child.
Aged persons
widdowes,
virgines,
babes.

Violent defiling of womē

6 No man of what degree soever he be, shall enforce any wife, widow, maide, or virgin, and by violence defile any of them, vpon paine of death.

Dronkennes and riotousnesse.

7 What person soever that shalbe commonly geuen to dronkennes, or riotously behaue himselfe, shalbe banished the Armie.

Concealmēt of treason. Conspiracie.

8 Whosoever shal conceale, or in any sort keepe secret Treason, any dangerous conspiracie, or other practise, which may be hurtfull, and may concerne the peril of her Maiesties person and Realme, or of her Generall, or the estate of this Armie, and shall not with all diligence reueale the same either vnto the Generall, or some other Officer of especiall trust, shall incur the paines of death with torments.

Treason and conspiracie.

9 If any man whatsoeuer shall practise and conspire any thing to the hurt or perill of her Maiesties person and Realme, or of her Generall, or the estate of this Armie, and be thereof lawfully convicted, shall suffer death with torments.

Conference, or writing with or to the enemye.

10 No man shall haue speech or conference, send message, deliver or receiue letters to or from the enemye, or any his confederates, either secretly or openly, without manifesting the same presently vnto the Generall or Marshall, or other hauing authoritie so to doe, vpon paine of death.

Departing from the Camp or the Garrison without leaue.

11 No man being in this seruice, shall depart y^e Camp or place of Garrison for any cause whatsoeuer, without the Generals especiall Waspport, or other head Officer authorised, vpon paine of death.

Breaking order of the Ranke.

12 No man shall bzeake out, or leane the order of his Ranke, being once ordered in the field by the Marshall, or Sergeant Maior, without some great occasion first made knowne vnto the said Officer, vpon paine of losse either of life or limme, at the discretion of the Generall, or of the Marshall.

13 No man appointed to watch o2 ward, shall thinne o2 depart the place, neither shall sleepe, o2 neglect his duetie therein, especially after the watch is set and the wo2d giuen, vnlesse he be o2derly relieued, o2 for some great occasion enforced, with licence of his Captaine o2 Officer vpon paine of death.

Watch and
ward neg-
lected.

14 No man shall be w2ay the watchwo2d to the Enemie o2 to anie other, o2 giue any other wo2d then is deliuered by the Officer, vpon paine of deathe with to2ment.

Watchword
bcwrayed.

15 No man shal raise anie Mutinie, o2 procure vnlawfull assemblies vpon priuate, secret, o2 hidden purpose, whereby to disturbe the peace and quiet of the Armie, vpon paine of death.

Mutinie or
vnlawfull
assemblies.

16 No man shall lift vp his weapon against the Magistrate, his Captaine o2 Officer, vpon paine of death.

Weapon a-
gainst Magi-
strate.

17 No man shall quarrell, b2awle, o2 make any fray within the Camp o2 Towne of Garrison, vpon old malice, o2 newe occasion whatsoeuer, but shall complaine to the Officer, who is to decide the cause and punishe the partie offending, vpon paine of losse of life o2 limme, at the discretion of the Generall o2 Marshall.

Quarrelings
or fraima-
king in camp
or Towne of
Garrison.

18 And whereas sandie nations are to serue with vs in these wars, so as through diuersitie of languages occasion of manie controuersies may arise o2 happen to grow: It is therfore ordained, that if any person of English Nation shall finde himselfe agræued with any wrong proffered him by anie forraigner, that then without profering further reuenge, he shall signifie the same vnto his Captaine, o2 other Officer, whereby o2der may be taken, so as no further quarrell growe thereof, but that quietnesse in all respectes may be preserved, vpon paine of such punishment as the head Officers shal thinke meete, either by losse of life o2 limme.

Forrainger a-
bused by
Englishmen.

19 No man appointed to the defence of any Breach,

Leauing
Breach,
Trench or
Streight vpon
fained
excuse.
Souldiour
inrolled vnder
two
Captaines.
Fraudulent
Ione of Armour.

Armour embellished,
diminished, or
pawned.

Playing away
of Armour.

Pilfering of
his fellowes
victuals.
Forceable
exaction of
victuall or
goodes.

Victualles
forestalled.

Trench, or Streight, either Captaine or Souldiour, shall willingly leaue it, or vpon ante false or imagined cause or excuse shall absent himselfe from the place without sufficient warrant, vpon paine of death.

20 No man shall inroll his name vnder two Captaines, nor Muster in severall companies at one time, or otherwise passe in another mans name, vpon paine of death.

21 No man shall lend Armour, Weapon, or other furniture vpon the Muster-day, whereby to abuse her Maiestie, and weaken the present seruice, vpon paine of two monethes imprisonment, and banishment.

22 No man shall embesill or diminish anie of his Armour, Weapon, and Furniture, which is appointed him by his Captaine, vnlesse he can proue that he lost the same in seruice. And that no man shall take in pawn any Souldiours Weapon or Furniture, vpon paine to the Souldiour of losse of his place, and to the other that shall take it in pawne, the losse of the double value.

23 No man shall play away, engage, or lend away his furniture, but shall alwaies keepe his Armour and Weapon cleane and seruiceable, vpon paine of imprisonment.

24 No man shall deceitfully take away his companions prouision, victuals, or furniture, vpon paine of death.

25 No person traouelling, lodging, or abiding in any the Townes or Countries of her Maiesties friends or Allies, shall in anie wise exact or take by force from the people either Victuall or other their goodes whatsoever, without present payment, or other sufficient order to the iust satisfaction of the partie, vpon paine of death.

26 No man shall forestall any victuals brought for the Campe or place of Garrison, but suffer the same peaceably to come into the Market place, there to be rated and prised by the Marshall or his Officer, before hee buy the same, vpon paine of death.

27 No man shall robb or spoyle anie Shoppe or Tent, or any Victualler or Marchant comming for reliefe of the Campe or Garrison, but in all good sort shall entertaine and defend them vpon paine of death.

Robbing or spoiling of Vitler or Marchant.

28 No Souldiour commaunded at anie time to take victuals for certaine daies, shall excede the same daies, or spend the same otherwise then according to the proportions and time allowed him, vpon paine of imprisonment, or other such punishment as the lawfull Officers shall appoint.

Exceeding the daies for taking of Victuall.

29 No man shall distresse or spoyle any person standing on her Maesties partie, or being vnder the Generals protection, vpon paine of death.

None to be spoiled being of the Generals protection.

30 No man shall disobey or transgresse any Proclamation made by the Drumme or Trumpet, set forth by the Generall, vpon such paine as he shall set forth.

Proclamation transgressed.

31 No man shall resist the Prouost or his other Officer in apprehending of anie Malefactor, but if neede require, shall ayd and assist him therein, or otherwise if by such occasion anie escape be made, it is ordained that euery person by whose default the escape was committed shall suffer like punishment that the parties so escaped should haue indured.

Resisting the apprehension of Malefactors.

32 No man shall molest or trouble any person being vnder his owne Regiment, or the leading of anie other, once placed by the Marshall, Furrier, or Herbingier, in the Campe or Towne, but quietly to permit and suffer euery one to enioy his severall roome or lodging, vnlesse it be by Mutuall consent and agreement, neither shall anie man lodge out of his Captains quarter without licence, vpon paine of imprisonment.

Disturbance of any in their lodgings.

33 No man shall ouerthrowe or destroy any Water Milles or Water Moles without speciall commandement of the Generall, or other head Officer, vpon paine of death.

Water-Milles.

Burning by
fire.

34 No man contrarie to order, shall set on fire or burne any house, Mill, or Cozne, nor at dislodging or removing shall set the Campe on fire, without speciall commandement from the Generall or other head officer present, vpon paine of death.

Silence in
Watch,
Ward, or
Ambush.

35 No man shall make anie outcrie or noise in any watch, ward, ambush, or anie other place where silence is requisite and necessarie, vpon paine of losse of life or lim, at the Generalls discretion.

Alarme.

36 No man without great occasion shall make any Alarme, but if any chance to arise, then shall euery man presently repaire in all hast vnto his appointed place, vntlesse some true excusable cause doe hinder him: vpon paine of death.

Harbouring
of strangers
not in pay.

37 No man shall harbour or receiue into his lodging any person being a straunger, or of our owne nation not being inrolled in her Maiesties paie, but shall presently acquaint the Generall, or Marshall with his name, Countrey, the time of his comming, and businesse vpon payne of imprisonment, and losse of his place and wages.

Talking with
the Enemies
Trumpeters.

38 No man shall talke or haue conuersation with anie Trumpetter or Drummer of the Enemies, or other sent in message, but such as be appointed by the Generall, vpon paine of death.

Attendance
vpon Carriages.

39 No man shall attend vpon the Carriages, but such as are appointed to that charge, neither linger, or loyter behind with them to ride or ease themselves, vntlesse it be such as by sicknesse, hurt, or other infirmities knowne to the Officers, to be permitted so, vpon paine of imprisonment and losse of wages.

Forraging.

40 No man shall attempt to goe a forraging, without the Officer appointed for that purpose to deliuer them a sufficient Guard for their defence, vpon paine of death.

Souldiours
prisoner.

41 Euerie Souldier shall present suche Prisoners as
are

are taken, to their Captaine immediatly at their returne to the Campe, and none shall either kill them, or licence them to depart, without commandement or leaue from the Generall, or other head Officer thereunto appointed vppon paine of being disarmed, and banished the Campe.

42 Every Souldiour at all times in seruice shall be obedient and faithfull, as well to their Captaines as other inferiour Officers, and not to refuse direction of any, vnder whome they are appointed to serue, vppon paine of imprisonment, and losse of a monethes wages. And whensoever anie Captaine of anie Band shall vppon urgent causes appoint in his absence anie other whome hee shall thinke good to supply and execute his roome of Captainship, euery man ought to followe and obey the said deputie with no lesse care and diligence, then they would the Captayne himself, vpon the same paine.

Obedience
of the Souldiour to his
Captaine or
his deputie.

43 Euery man shall support and defend his owne Ensigne both night and day, and shall resort vnto the same vpon the first warning, and not depart untill it be brought into safetie, vpon paine of death.

Supporting
the Ensigne.

44 Every Souldiour shall diligently obserue and learne the sound of Drummes, Fifes, and Trumpets, to the end he may knowe how to answer the same in his seruice.

Sound of
Drumme,
Fife or
Trumpet to
be learned.

45 No man shall slaughter or kill anie beast of what nature soeuer within the Campe or Garrison, but in such places as are appointed for that purpose, nor shall suffer the garbage to remaine vnburied, neyther shall any man trouble or defile the waters adioyning, but in the lower part of the streame some good distance from the Campe, vpon paine of imprisonment.

Slaughter of
beasts, Gar-
bage: Wa-
ters vndefi-
led.

46 No man shall ease himselfe or defile the Campe or Town of Garrison, saue in such places as is appointed for that purpose, vpon paine of imprisonment, & such further

Easementes;

Prisoners
and booties
certified.

punishment, as shalbe thought meet by þe chiefe Officers.
47 If any man doe take a prisoner or bootie, he shall immediately after hee is returned vnto the Camps or Towne of Garrison, make his Captaine or Gouvernour acquainted therewith, and the Captaine shall declare the same vnto the Marshall, who euery eight daies shal make certificate thereof vnto the Generall, vpon paine of imprisonment, and further punishment as the Generall shall set downe.

Crie at the
putting vp
of an Hare.

48 In Marching by the Fieldes, no man at the putting vp of any Hare, or any other beast shall make anis shout or crie, whereby to disquiet or stay the rest of the bands, but to vse al quietnesse and silence in their march, vpon paine of imprisonment.

Place of
charge giue
to the Enc-
mie.
Flying to
the Enemy.
Passage by
ordinary
way.

49 No man shall giue vp or deliuer vnto the Enemies any place left to his charge or keeping, vpon paine of death.

50 If anie man flie to the Enemies, or be taken vpon his departure towarde them, he shall suffer death.

51 That no person whatsoeuer shall passe by any other way either into Towne or Camp, but at the ordinary Gates and Passages, vpon paine of death.

Herauldes.

52 That all Herauldes of Armes shall doe their messages, and make proclamation at such times and places and in such order without addition, diminution or alteration, according vnto their direction and Commission from the Generall, vpon paine to be inflicted at the Generals discretion according to the qualitie of their fault.

Captaines.

Intising of a
Souldier
from his
Captaine.

52 No Captaine, Officer, or other person, shall receive or entertaine anie other mans Souldiour or seruant, without consent of his former Captaine or Maister, neither shall entice another mans Souldiour from him, vpon paine of losse of a Monethes wages, and

and to restore the partie to his former Captaine or Master.

53 No Captaine shall send forth any men to doe any enterprise, without knowledge of the Generall, or chiefe Officer appointed thereunto, vpon paine of losse of his place.

Doing any enterprise without the Generals knowledge.

54 All priuate Captaines, being no head Officers, shall watch and ward with their Ensignes, vnlesse it be by speciall leaue, vpon paine of the losse of a Moneths pay, and for the second time, losse of his place.

Watch and ward by priuat captains

55 No Captain shall sel or raunsome his prisoner without licence of the General, and shall not suffer them to depart without making the high Marshal priue to y same, vpon paine of losse of his prisoner, and imprisonment.

Prisoner ransomed or sold.

56 Any Captaine finding any Souldier, of what band or companie soeuer, which hath transgressed any of these lawes and ordinances, may take him, and bring him vnto the Marshal to be punished.

Souldier transgressing to be taken by any captain.

57 That no Captaine shall receiue, or enroll any person into his pay vnder him, but that he cause the said souldier to receiue the othe, vpon paine to the Captain for not obseruing the same, of losse of a moneths pay.

Souldier sworn before he be receiued.

58 No inferior Captain shall for corruption, or any other cause, license any of his souldiers to depart y campe or garrison, without speciall licence of the Generall, or other head officer, vpon paine of losse of his moneths pay, and expulsion out of his office.

Captain not to licence any souldier to depart the Camp.

59 If any Captain hereafter receiuing his souldiers pay, do not pay the same vnto them within 8. dayes after, and being demaunded, then vpon complaint made, & the Captain therof conuicted, he shall lose his moneths pay, & be depriued of his office, banished the campe, and disabled from thenceforth to serue in this Armie.

Souldiers pay deteined

60 Captains and officers shall frequent and resort vnto the Souldiers Lodgings, to see in what state their

Visiting the Souldiers furniture.

armour and munitions be in, and to geue great charge of their furniture be alwaies in readines, their corzlets, with all peeces belonging to the same, and their Caliuers to be made cleane and oyled, to haue match and powder drie, & strings for their bowes, their billes and halberts to be kept cleane and sharpe, vpon paines and punishment arbitrarie, accordinge to the qualitie of their negligence.

Punishment
of all other
offences.

61 Al other offences and actes that may tend to disorder, not comprised within these Articles, shalbe subiect to such manner of punishment as the Lieutenant Generall shall inflict vpon them, as if it had bene specially exprested and set downe.

Publishing of
the Articles.

62 And to the intent that no man may pretend and alledge any iust cause of ignorance of the afoze recited lawes and ordinances, or any of them, the said Lord Generall doeth ordeine, That all chiefe officers, and captaines of this armie, shall cause the same to be read and published within their band euery twenty dayes, to all those which be vnder their charge respectiuey according to their quarters, especially in all those places where they shall lie in garrison, as well horsemen as footmen, and to cause the same to be kept and obserued inuiolablie, as much as in them lieth, in euery branch and article of the same, according to the tenor, forme, and effect thereof.

The forme of the oath which all officers, captaines, souldiers, and all other seruing in this armie shall take and performe.

I A.B. doe sweare and promise to doe all loyall, true & faithfull seruice vnto the Queene of England her most excellent Maiestie, and vnto the Prorinces and Cities united in these
Comm-

Countries, and their Associates, under the charge of the right excellent the Earle of Leicester, Governour Generall of the said Provinces and Cities, and their Associates, and of her Maiesties armie and forces within the same, and all lawfull and due obedience vnto the said Governour, and to any other Superior that shall haue charge vnder him for gouernment in this Armie. And further, I do promise to indeuour my selfe to fulfill and keep all such lawfull ordinances, as his Excellencie hath or shall set foorth and establishe for the better ordering of this Armie, as much as concernes me, so long as I shall serue in the same vnder him. So help me God by Iesus Christ.

Certaine Militare Ordinances, published
and practised among the Spaniards.

THat all Souldiers (after they are receiued or elected by their Captaines with such circumstances as is required in such election, at such time as they shalbe entered in-to pay, or admitted by the Officers of account by oath) shalbe bound to serue his Maiestie faithfully, and likewise his Captaine Generall: to obey all his superior Officers, not to part from the Armie, nor from his companie, without licence in writing from such as haue authoritie to geue it.

Also, forasmuch as to blaspheme GOD, or vainly to sweare by his holy name, is a very great sinne: No Souldier shall renounce or blaspheme, vnder paine for the first time thirtie dayes imprisonment, for the second sixty, and to be shamed openly with a gagge on his tongue, and for the third to be made a Galley-slaue, either perpetually, or to some time certaine.

That no man play at vnlawful games that prouoke me to these blasphemies, vnder the paines aboue mentioned.

That no man keep in his house any suspected woman, vnder pain (if he be an officer) to lose his office: if a Pensioner, his pension: and for common souldiers, to be deprived of their pay for a time certaine, or at pleasure.

Farther, for that dronkennes doth turn men into beasts, and makes them many times vtter words tending to mutinies, and new sects in Religion: If any man drink dronk, he shalbe chastised as an infamous person with a *Banne*, that shal publish his fault.

That no Souldier go into any tauerne, or common tipping house to eat or drinke, vnlesse in trauailing, vpō paine for the first time to lose a Moneths pay, for the second two Moneths pay, and for the third time to be banished with shame.

And bicause the greatest point of a good souldier doth consist in this, That souldiers hold felowships, called in Spanish *Camerades*, whereby they may both better cheape finde themselues, then liuing single or apart, and also thereby linke in friendship, whereupon many great commodities depend.

These *Camerades* or societies ought to take great care that there enter not into their felowshippe any vitious or lewd persons, that might draw the rest to play: or if any of them should defraud their fellowes of that which shall be committed vnto him, for the finding of the whole Society (besides restoring foure fold) he shall for the first fault be committed to prison for a certain time: and for the second fault he shalbe condemned to the Galley.

Furthermore, forasmuch as God commaunds that we shall

shall not touch his annointed : That no souldier lay hands on any Priest or any other Religious person , nor misuse them in words , vpon paine of punishment according to the qualitie of the offence.

That no Officer lodge any man in any Church, Monasterie or Hospitall , nor in any house or Grange to them pertaining, vpon paine to loose his Office.

That no souldier of his owne head enter to lodge in any Church, Monasterie or Hospitall , nor in any Houses or Granges to them appertaining, vpon paine to be committed to prison for some time certaine, or at pleasure.

That no souldier touch or take any sacred thing , or appertaining to the Churches , Monasteries or Hospitals, on paine to restore seuen fold the thing taken or robbed, and to be punished corporally according the qualitie of the fault.

Furthermore, seeing that men of warre are entertained to auoid oppression, and to defend the weake and afflicted: That no Souldier force any woman on paine of his life : and especially such as are rendred or taken prisoners by assault : for that in such Cases the violence is such, as many for feare do consent to the will of them that require them. And till such feare be past , it must be accounted Force, albeit it seeme that they willingly consent to them that desire them.

That no souldier kill any woman or aged man, nor any impotent person, albeit in the Furie of Victorie, and this also on paine of life: nor shall lay handes on them, on paine to be punished according to the nature of the offence.

That all souldiers confesse themselves at least once a yeare, at such time as holy mother Church appoints : on pain to be punished at discretion, according to the circumstance of the fault in, respect of the time, & cause that made him disobedient.

That all Captaines and officers haue especiall care to learne if any of their Souldiers omitte to confesse themselves: and if by their admonition they will not go to Confession, then to aduise their Campemasters, to the end they may by Proclamation banish them out of their bands: and also to giue notice thereof to the Officers of Accounts, that they enter not these men in paye in anie other Bandes.

Farthermore that no Souldier after he is by the Captaine receiued, and by the Officers of Accounts allowed in any bande, shall part from that bande without expresse leaue in writing, first vnder the Captaines hand seene and allowed by the Campe masters, especially to go to any other *Tertio*, on paine to be banished the Armie with shame, and neuer after to be Capable of the Kings pay, And that Captaine that shall receiue such a Souldier without such lycense, shall loose his band, sythence for want of Iustice herein there hath happened disobedience among Souldiers, and quarrels, brawles, and murthers among Captaines.

That no souldier stray abroad to lodge out of the Campe or place where his Ensigne shall stand, without carrying in writing a lycense signed by his Captaine, &c. as is abouesaid : where must be set downe how many days he may be absent, on paine (if he haue a pension) to loose it : or if he haue but single pay, then to loose a monethes pay : and the like paine on them that returne not within the

the time by their Licenses prescribed, vnlesse they bring sufficient witnesses of iust impediments: for it is certaine that some craue leaue, lewdly to auoid paines, or to liue vpon others, and that more is, oppresse those whom they ought to serue.

That no souldier play away his Armes, or Engage them, on paine for the first fault to loose a monethes pay, and for the next to be banished with infamie.

Further that no Souldier play away or engage his garment, nor play vpon credite, on paine to the winner to loose his winnings, and to the looser to be committed to prison during pleasure: and the garment or pawne that he shall so lay or loose to be giuen to the Hospitall of his Tertio or Regiment.

That no Souldier omit to present himselfe at musters with all his Armes entire and well appointed, on paine to be Checked of his pay, or aduantage that he should receiue for those Armes, or for himselfe, and not to be allowed him till he haue those Armes to serue withall.

That the Captaines appoint these aduantages for *Harquebuziers* be readie and practized persons, and after they are entred in the muster bookes, they cannot change them at their pleasure, nor without a sufficient cause which must be made knowne to the Campe master, for by his decree onely it may be taken from him.

That all Souldiers at Musters haue dutifull respect vnto all the officers of Accounts and paiments, on paine of punishment at discretion on such as in word or

behaviour shall miscarrie themselves, according to the manner of their fault.

That no souldier passe the place in anothers name, on paine to be made a Gally slaue for a time arbitrarie: and for the Officer that shall wittingly passe him, the losse of his office, and such farther paine as the case shall deferue.

If any souldier shall strike a superior Officer, while he is about his Maiesties affaires, he shall dye for it.

If any souldier when he should be chastized by his officers for any fault or disorder (when he may escape) shall lay his hand to his sword and abide, he shall be punished at discretion, according to the place and qualitie of the offence.

If any souldier (for matters not touching order of the seruice of his Maiestie, especially for play,) shall lay hand or strike any Officer, he shall be punished at discretion according to the qualitie of the Fault: But the Officer shall not lay to his charge the striking of an Officer, for they ought not to giue vniust occasions thinking to be respected as officers, when it is not in matters of the seruice of his Maiestie.

That euerie inferior Officer shall obey a superior Officer in all matters concerning order, and the seruice of his Maiestie, although he be not his proper Campe Master, Captaine, Alphier, or Sergeant, on paine of punishment arbytrarie according as his disobedience or small respect shall merite.

That no souldier giue impediment to the ministers of Iustice in execution of their office, on paine of death.

Also

Also to auoyde vacaboundes and many other disorders and inconueniences that ensue by sufferance of men to follow the Campe without paye, and that Spyes may not safelie by that meanes also enter : It shall not bee lawfull for any man to enter into the Campe or Armie without paye allowed him in the Muster bookes : on payne that hee shall not be capable of any paye, or partaker of any praye or bootie, and also to be chastised as vacaboundes, if it be not approued that they be seruantes to some such as haue stipend in the Armie.

That no Souldier or other treat or practise with the Enemie especially in secret, on payne of death.

If any Souldier haue vnderstanding of any other that serues as a spye, or treateth with the Enemie, and shall not discouer it to some chief Officer, he shall dye for it,

Furthermore, for the auoyding of mutinies, and such meanes as are vsed to stirre vp and accomplish them : it is commaunded that all Captaines when they receiue any Souldier, shall vnderstand whether they can *Write*, and the cause the to write their owne names, & the names of their father and mother, and the place where they were borne, in a booke that euery Clarke or Furrier doth of purpose keepe for all the Band, whereby they shall greatly auoyde both *Chartelles* and *Libels*, for fewe can counterfait so well their handes, that shall not by some resemblance of letters be discouered, hauing such meanes to compare them together: to few in such cases dare trust another.

There shalbe no secret meetings nor vnlawfull Assemblies, for there be mutenies brewed, and there they treat by coniectures of all that is done in secret Counsels; whereof proceede aduertisements to the Enemy, whereby oft-

times they betray those that haue the charge of Castels and Forts, by whose iloth and tolleration these mutinous Assemblies are permitted.

Whosoeuer shall make or set vp any *Chartell*, or shall speake any seditious wordes whereof may proccede tumult or mutinie, shall dye for it, and not be heard.

Whosoeuer shal haue knowledge of any that hath written or set forth any *Chartelles* or *Libels*, or spoken any seditious wordes, and not reuealed it presently to his Superiours, shall incurre the paine of the principall, and haue the same punishment.

Furthermore, for asmuch as the Armie cannot be sustained vnlesse victuallers may safely come and go, and vnlesse the milles, villages, barnes, houses, and other places of the cōfines be kept and preserued: it is cōmaunded, that no Souldier nor other person shall stirre abroad to take victuals or other spoyles, nor to hinder such as cōduct them, nor breake any milles, barnes, villages, houses, or other places of the confines, on payne of death.

That no man shall take nor buy any victuals, but in the market place, and after they are prised by the Officers thereto deputed, on paine arbitrarie.

Also for auoyding of controuersie betweene different Nations, that no man shall vse gaming or idle play with any of another Nation, on paine arbitrarie, which shall extend to life, if any fray grow betweene them about it.

That no person neither within nor without the Camp shall take any thing from any person of any other Nation, vpon payne arbitrarie.

Further-

Furthermore, seing it should serue to small purpose to settle the Camp in an wholesome place, with all other parts therto agreeable, if afterward the aire should be infected with the filth and excrements of many dayes: It is commaunded that no Souldier or other person do any such thing within the quarters of the Camp, nor in any other place that may infect the aire, or annoy the Camp, on payne arbitrarie that may extend to life, as there shalbe cause.

That the persons deputed to carrie dead beastes out of the Camp, take especiall care to carrie the away, and burne them, and to couer other excrements & filth, in such sort as it annoy not more the Camp then the Enemies, on paine, if they be found negligent to be punished for Example.

That no Souldier or other person set vp Tent, or make Cabin out of a quarter assigned him by the Furryer, on payne arbitrarie.

And bycause by not ending old quarels new tumultes and mutinies in Cāp do oft arise: It is ordered, that no Souldier on paine of life shall talke or haue communication of any old quarell: but onely to accord and end the same.

That no Souldier for no new or old quarell shall challenge any other, on payne of death to the challenger, and of banishment to the defendant that shall meete him, if hee may scape without note of infamie.

That no Souldier comming to any quarell, enter into it, either in Camp, or garrison, on payne of death.

If any Captaine or Officer shall lift vp his hand to chastise any Souldier, saying, kill or mayme him: he shall loose his companie, albeit it fall not out as he sayth: But if the Souldier be slaine, the Captaine or Officer shall dye for it,

albeit it be not he that killed him, or hurt him.

If any Captaine or Officer by hand chastise a Souldier, let none other person set to his hand, on payne arbitrarie, that may extend to life, if the case so require.

If on sodaine motions which men can hardly gouerne, a couple fall out and set their handes to their swordes, let those that are present part them, and reconcile them without taking part with the one or the other, on payne arbitrarie, which may extend to life, if the case so require.

And whither soeuer there shalbe any occasion to transport or carry their Ensigne, let Captaine, Officers and Souldiers (all with their Armes) go in order, on paine of punishment arbitrarie.

That during the time of garde, the Ensigne there remaining, the Captaine and Officers shalbe there, and not permit any of the Souldiers, to leaue it without license, or for any vndue cause: on payne arbitrarie to the Officers, and such correction on the Souldiers as they shall in heate giue them.

That no Souldier leaue the *Sentinell*, on payne of death, nor part frō the place where their Officers leaue them, nor sit downe, on payne of such correction as the Officers shall geue them in furie, which may extend to life, if they finde him a sleepe.

That as oft as an *Alarme* shalbe geuen, the Ensignes shall with all speede together with the Captaines, Officers and Souldiers reaire to the assigned places, on payne to to him that shall delay, if he be an Officer, to be depriued of his Office, and for a Souldier, such punishment as his Officer

cer may geue in the heate of his furie.

And if he cannot readely put on his *Armes defensue*, let him go with his *Armes offensue* onely, for sometymes such speede is required, as if the Souldier come to late, albeit he come with all his *Armes*, yet is he subiect to such correctiō as his Officers may geue him in the sodaine furie.

That no mā dare to geue any false *Alarme* without order from such as haue thereto authoritie, on paine of death.

That all Souldiers with great diligēce attend to the first found of the Drumme to call them to their Ensignes, on payne to them that do not, or shall come too late, to receaue such correction as their Officers in furie shall geue them.

And if any Souldier in march shall step out of his place (as many tymes they will to robbe and spoyle,) These are to be punished not onely for breaking their array, or leauing their place by their Officers assigned thē, but for such disorder it may also extend to his life.

That no Souldier (without lawfull cause) leaue of any part of his *Armes* while he marcheth, on payne to bee throwne out of his ranke with shame.

That no Souldier follow the baggage or women of the Campe without license in writing from such as may geue it, on payne to be disarmed and spoyled by the Prouostes of the Camp.

That all Souldiers in march shall obey all Officers in the Armie, albeit they be not of their owne Band or Regiment, on payne of such correction as any Officer (that shall finde them out of array) may in furie geue them, if they

shalbe disobedient.

That whatsoeuer person shall bring any Ordinance, albeit he be none of those Officers that ordinarylie doe it, yet shall he haue free passage, on payne to him that shall resist, of punishment arbitrarie, which may extend to life, if the case so require.

That no Souldier go to viewe any Camp or Fort, or other thing, without leaue from such as haue authoritie, on payne of death.

That no Souldiers begin a skirmish without leaue of such as haue authoritie, on payne of death.

Furthermore, if any place redring it self shal become vnder the protection of his Royall Maiestie, or his *Lord Generall*, whether the same be Citie, Village, Castle, or Fort, no Souldier shall presume to enter there into to sacke, or take any thing without expresse order, on payne of death: nor shall approach the ditches or walles thereof vnder colour of Inquirie of the cause, on payne of punishment arbitrarie, which may extend to life if the case so require.

That no Souldier or other person stray abroad without license of such as haue authoritie, on payne both to loose all he shall get, and further punishment arbitrarie which may extend to life, if the case so require.

That whatsoeuer shalbetaken in these Rodes, or Iourneis, be brought to such superiour Officers as by authoritie haue geuen them license: on payne to them that shall concale or defraude any part, not onely to loose their due portion, but also punishment arbitrarie besides.

That no person go to any sacke or pillage on the Enemy, without expresse order, on paine of correction arbitrarie.
Finally

Finally, that no Souldier prate nor talke while he is in Ordinance or in Squadron, on payne to be throwne out of his ranke with reproch and shame, as a violatour of Souldierlike modestie.

*Sic Argina phalanx in praelia densa moueri
Assidue, pariterq, suos Dux quisq, regebat
Imperitans, alij mox festinare silentes:
Dixeris haud tantas gentes sub pectore vocem
Condere, conspecti metuentes principis ora.*

But seing the chief cause of all disorders groweth by conuicting of spoyle, that ought to be taken away by reducing all spoyles (duely taken of the Enemy) to a publike heape: and then to proccede according to these *Articles* ensuing.

After the custome of *France* or of *Castile*, the Kingdome, Prouince, or Segniorie, the captiue King, Citie, or Towne

It is the Kings, that ruleth Soueraigne: but the taken Generall is the takers prisoner, and him may he raunsome at his owne pleasure.

And any inferour person taken in battaile by any of ours, (vpon particular challenge man to man,) is his owne, good, and lawfull prisoner.

All baggage that is found within a Citie, got by assault, or els by Batterie, is pray, to be sacked by any Souldier.

Geuing neuerthelesse to their chief Commander all their Munitions, Standard, and Ensignes with all the great and grosse Artillerie.

Ec ij.

The peeces that are not sound nor whole
dismounted or without their wheeles,
are all the Master of the Ordinance Fees.

But such as are dismounted by them without
the Gunmers take, together withall those
that by their Arte are battered or burst.

This (confesseth the aduersarie) is a gallant custome
saying, to me it seemeth verie good,
well may your Souldierie be therewith contented.

But this is (quoth he) onely in a generall Battaile :
albeit *David* say it is not of right,
but onely of bootie gotten by Inuasion.

For then a heape of all spoyles should be made,
and out of that the taken to be raunfomed,
and the hurt and wounded to be recured.

And horses lost in seruice recompenced,
euen what they cost (if bought without the yeare)
or els the present value by oath approued.

And then after this is past and done,
whatsoeuer remaines should be diuided
ratably, according to ech mans charge and place.

This was the course by *Alphonso* established,
not onely of that which is taken in Rhodes,
but euen of that also which is wonne in battaile.

These orders are not obserued in these dayes :
but such a Generall as makes them kept,
may doe farre more honorable and great exploits.

The Conqueror shall not then need to feare,
that the Conquered should repaire his forces againe:
nor the valiant part till victorie be cleare.

He that by order is absent from the spoile,
will notwithstanding abide at his due charge,
knowing, that of others pray he hath his part.

And they (that for the guard of Campe remaine)
will tarrie out their due appointed time,
knowing they shall haue their part in others spoile.

*These and like orders made Rome Lady of the world, and
by neglect hereof, Couetous of Spoile in these dayes workes
great mischiefes &c.*

I omit the rest at large set downe in that discourse by a
Spanish Campmaster that extolleth the *Antique Romane
discipline* farre aboue the *Spanish*. And yet we see that small
handfuls of that megre wretched Nation (onely by obedi-
ence to their officers, and reuiuing among them a few of
those antique Romane customes) haue done things almost
incredible, euen in these our dayes.

The Lawes and Ordinances for gouerne- ment of the Armie vnder the conduct of the Prince of Conde, in the ciuil Warres of France.

*The oth ministred to all the Nobilitie, and Gentlemen
Captaines, and others within their Armie.*

YE shall sweare before the *Liuing God*, that for the cau-
ses and occasions contained in the Protestations made
by the *Prince of Conde*, ye shall aduenture your Bodies,
Ee ij

Liues, and Goods, and all other meanes that God hath giuen you, vnder the charge and obeyfance of the faid Prince, whom ye knowledg as Chiefe, and Conductor of this Armie: ye sweare and promise your obedience to all what-focuer shall by the faid Prince or such as beare charge or office vnder him be commanded, to obserue duely all such *Militare Ordinances* as by them shall be prescribed for the gouernement of this Armie, &c.

THe Prince hauing by experience found, that no Armie can be well ledde and gouerned, if it be not well ordered, ruled and disciplined, and the same not possible to be done, if at the first good Lawes and Ordinances be not prescribed: And if such things haue bene obserued among them that had no knowledge of God nor of true Religion, much more ought these things to take place among those that make profession of True Religion, who ought to be as a Precedent and Patterne to others in all right and Iustice, & not in disordered and dissolute liuing, as in our last warres, and euen verie lately also hath bene seene: For this cause the Prince being willing to discharge, as far forth as in him lieth, the duety and charge that God hath committed vnto him, being duely thereunto called, after he had assembled the most notable & best able Gouvernors, Captains, & other of the best iudgement and understanding of all such as were to be found in his Armie, hath agreed vpon these Articles and Ordinances ensuing, the which his pleasure is shall be precisely in euerie point obserued and kept, vnder the paines in the same articles contained.

And if any such be, as peraduenture shall not like to allow of them, the Prince meaning not to compell any, but by voluntarie obedience, giveth them free warning to retyre themselves out of his Armie, meaning that all such as shall remaine vnder his conduct shal inuiolably obserue al these his Lawes & Ordinances, the which he wil see indifferently executed vpon al sorts, without regard or respect of persons.

And

And first the Prince enioyneth all such persons (whether they be Horsemen or Footemen, Gentlemen or others) if they be not of the number of those that haue Charge, that they Range and Enrolle themselves under some one Cornet or Ensigne, there to take their Oth as is appointed for them, and that within sixe dayes after they shall approch the Armie: Otherwise if they be found in default after the said time, all their Armour and Horse to be to the proper use and benefite of him or them that shall bewray the same to the Prince or to the Marshalls of the Campe.

And all such as shall cause themselves to be enrolled, shall be bound to obserue and performe their dutie in Watch, Scout, and Scourage, accordingly as shalbe ordained by the Marshalls of the field, their Captaines, or other Officers hauing charge ouer them, upon paine, if they disobey, to be dispoiled of their Armour, the wich shall be confiscate together with their Horses to the use and benefite of their Captaines.

Neither may they that haue taken their Othe depart from their Cornets or Ensignes without the leaue and permission of their Captaines, the which they must make apparant before they be elsewhere receiued: and if any shall do otherwise, the Captaine from whom such are departed, shall cause them to be brought before the Prince, who shal take such order for recompence betweene the Captaines, as to him shall seeme meete: And touching the offenders, their Horse and Armour shalbe confiscate to the use and commoditie of the Captaines from whom they are in such sort departed.

And to the end no man be vnawares surprisid with this danger: The Prince commandeth all his Gouvernors, and Captaines to cause daily these Ordinances to be published, and made knowne to such as from time to time shal newly come into the Army, and Range themselves vnder their Cornets or Ensignes.

And because some Captaines may happily abuse or ill handle their Souldiers: The Prince permitteth them notwithstanding their said Othe, upon iust occasion to demand

leane of their Captaines to depart: And upon refusall or deniall, to repayre vnto the Prince, who hearing euther part, will take such order as shall seeme vnto him reasonable.

And to the end all things may with good order be directed: the Prince willethe and commandeth, that this Othe by him ordained, shall monethly be renued, and that if then there be any Gentleman or Souldier that will abandon his Captaine, it shall be lawfull to declare the same before him that shall be appointed Commissioner to take the Muster and giue the Oth, who may giue Licence to the same Gentleman or Souldier, if so be that he finde no doubt or difficultie by reason whereof he thinketh it conuenient to refer the same to the Prince himselfe, or such as shall expressly from the Prince be assigned to examine such Debates & Differences: And in the meane time, the Prince expressly forbiddeth all Captaines and Gouvernors to practise or suborne one anothers Souldiers.

And to discouer such as shall depart the Armie without leane, the Prince enioyneth and commandeth the Commissioners that shall reuiew the Musters, monethly from time to time to present vnto him the Rolles wherein shall be written the Names and surnames, together with the abode of euerie person, to the end such as shall be found culpable of such a fault and infidelity, shall publikely be denounced and declared Enimies of God, and traiterous for sakers of the cause.

And forasmuch as the Prince desireth nothing more than to cleare his Armie of Vagabonds, and such vnnecessarie people, he expressly forbiddeth all persons to follow his armie, that are not Enrolled, and orderly auowed, the which they shall sodainly make manifest whensoever it shalbe demaunded by signed Certificates. The Footemen and Horsemen to haue their Certificates from their Captaines, the Lackeys and seruants from their Masters, and the Viſtualers, Merchants and Artificers from the Prouostes and Campe-masters, vpon pain that whosoever shall after three dayes ensuing the proclamation of the Premisses, be found without the said Certificates, he shall be

be hanged and sirangled.

And to the end euery Capitaine and Gouvernour may the more easily render an account of such as shall be subiect to their charge, being very hard to commaund more then 100. horse. The Prince willethe and ordeyneth, that no Cornet shall haue any greater number, and neuerthelesse, if any Gentleman, by reason of the good will which shalbe borne vnto him shall haue any greater numbers to follow them, The Princes pleasure is, they shall diuide them according to that rate of hundreds, appointing their Lieutenants accordingly. And as for Foote bands, euery Ensigne to containe 200. souldiers.

The Prince also expressly forbiddeth all that serue in his Army, to goe to any seruice or enterpriſe without leaue, vnder pain, if he be a Capitaine, to be deprived of his charge: if he be a private Souldier, to be deprived of his Horse and Armour, & banished the Army. As he doth in like manner forbid al Souldiers of his Army to abandon their Cornets or Ensignes, ordeyning that such as shalbe found from their said Cornets or Ensignes, spoyling forraging, and praying, to be corporally punished as robbers and theeves, and breakers of these Ordinances, and their spoyle, together with their Horse & Armour, to be to the vse of such as shall bring them before the Prince to answer their offence.

And for as much as this Warre, being of another Nature then other Warres, ought also to be ruled after another fashion, The Prince commandeth that all Prayes and Booties shalbe brought and put into the hands of such persons as shalbe by him deputed and assigned, to the end the commoditie & benefite thereof resulting, may reasonably be diuided and imparted to the maintenance of the Warre, & relief of such as shall haue need thereof, Provided alwaies, that if any such Enterpriſe be made, as the Souldiers gene Battaille, or fight for it, that then the Bootie shalbe diuided, according to the auncient lawes of the warres. And for all other Prayes and Booties, one Third to remaine for the Captains and Souldiers, and the other Two

Thirde for the publique cause and maintenance of the Armie. And if there be any that doe conceale any parte of the Bootie, the Prince his pleasure is, that some honest, and present consideration (according to the value of the thing) be bestowed on the reuealer of the fault: and the concealer to be corporally punished as a Theefe, and Enemie to the cause.

The Princes pleasure is also, that all compositions of Villages, Castles, and other things of like nature and quality, be committed into the hands of him or them that shall by the Prince be thereunto deputed, to be by them converted to the use before mentioned.

And forasmuch as great abuse is often committed in the taking of Booties, the Prince ordeyneth, that nothing shalbe reputed or declared Bootie, vnlesse it be verified and duely approued by those of the Counsell, and made apparant either by some such as were taken, together with the Bootie, or by some other good and sufficient testimonie.

And to the end all such things (of what Nature soeuer they be) that shalbe receiued, shall truely and faithfully be handled and distributed. The Prince will choose some one principall Personage, of good qualitie and reputation, who shall keepe a Rolle, or counterpane of all such things as shalbe receiued.

And because there are many that entertaine a greater train then they ought, vnder colour that they line at Discretion, the which full ill agreeth with the profession of our Religion, and ingendreth great confusion in an Armie, and sometime danger and losse, by reason of the great superfluitie of baggage. The Prince exhorteth and admonisheth al Gouvernors & Captayns, be they Horsemen or Footemen, to be diligent and carefull in searching and examining the state of thinges, and not to permitte any to haue a greater Trayne then is necessarie, &c.

And forasmuch as all disorders doe principally growe by
reason

reason of the excessive Traynes and Baggage that Foote-men and Horsemen carrie with them, who commonly doe use to robbe, and steale horse, and other labouring beastes, to carrie their Pillage: The Prince willeth and commaundeth, that none shall haue more then one. Seruaunt or Lackey for euery three Souldiers at the most, and those also to be bound to follow the Ensigne as wel as their Masters, and not to stray from their Quarters vppon paine of hanging and strangling. Neither shall it be lawfull for them to serue their turne with Horses, Oxen, Asses, or such like: the which he declareth and ordyneth to be confiscate and forsaite, if their proper Masters, to whom they ought indeede to be restored, doe not challenge them, onely vnto Captaynes and Officers for their owne proper vse and commoditie, the Prince doeth allow the vse of them.

And to preuent and meete with such abuse as may growe by dissimulation, or winking at such faults, the Prince his pleasure is, that those his Commissioners also, shall muster and renew the sayd Traynes and Baggage, and reforme and cutte off that shall seeme vnto them superfluous, and of them to make a Register, to the end thereby more easilie the offences committed against the prescribed orders, may be discouered. And in the meane time, considering the mischief and inconuenience that doeth growe by such robbing and stealing of labouring beastes.

The Prince ordyneth, that such as shalbe atteinted and conuicted to haue robbed or stolne any of that sort of Beastes, shalbe senerely and rigorously punished as traitors and enemies of the publique cause, vnlesse they be sick or hurt, & in that case they are enioyned to make their Captaines priuie, who shal provide for them.

And forasmuch as at the place where the Armie shall first assemble, they doe commonly determine of their Enterprises, and debate many other important matters for the safetie of the Armie marching and lodging. The Prince

commaundeth all those that haue charge, to be there present, & also the chiefe of euery Troupe, or at the least their Lieutenants or Cornets, euery morning to geue their attendance at the lodging of their Chiefes of the Armie, whether it be of the Battaile, or Vaward, there to vnderstand what is for them to doe.

The Prince his pleasure also is, that all such safeconductes as shall by him or the Admirall be geuen, shalbe respected and regarded, vpon paine of death.

The Prince also expressely forbiddeth all persons to robbe or spoyle any Victualers, or other commodities that shalbe brought into his Camp, vpon paine of death.

And to the end that no man shall pretend ignorance of these Ordinances, the Prince his pleasure is, that the chiefe Gouvernours and Captaines of his Armie, shall euery weeke cause them to be publicly read, both in the Battaile and Vaward, and in all parts and Quarters of those Regiments, and in all other places of Garrison, or assembly of Souldiers, and the same to be inuolably obserued in euery point, according to their tenure and true meaning, & the offenders to be senere-ly for example punished, without altering or innouating of any of the Lawes and Ordinances of the Kinges Maiestie, as well touching the ordering of Men at Armes, as Footemen, all which, ouer and besides these presently published, the Prince commaundeth duely to be obserued and kept.

These Lawes ordeyned by the Prince, the Admirall, and other famous Souldiers: I haue here published, not to the ende euery Generall shoulde be bounde to the selfe same Lawes, but imitating their pollicie, to assemble their principall Officers, Coronels and Captaines, and before they march forward, to decree such Lawes and Ordinances, as may seeme moste fitte for the gouernment of such people as shall serue vnder them, mittigating, or increasinge the paynes, as shall bee founde meete.

And the same to be published, and by *Oibe* receiued, as in this *Precedent*, and in the honourable ancient *Romaine warres*, was alwaies accustomed, whereby such extreame disorders, and spoile of men shalbe auoyded, as alwaies is seene in those *Regimentes*, where *Discipline* is neglected, and men onely by *Discretion*, or rather by *Fantasie*, directed and corrected.

CHAP. XXIII. The Lord Generall.

This Office and calling is so honourable, high, or rather Maiesticall, as it is in deede most fit for Kinges themselues, and not to be committed to inferiour persons, but such as for *Authozitie*, *Wisedome*, *Nobilitie*, and *habilitie* are the chiefe and choise persons of an whole Realme. In that famous Italian *Hystory* of Francis Guicciardine you shall see notably set forth the cause and reason of that honourable successe of the French Armie, led by Charles the 8. himselfe: who with incredible celeritie violently passed through those mightie States: where he sheweth how by reason the king himselfe went in person, there was such numbers of Nobilitie and Gentlemen in in the Armie, as not onely the great Commanders but euen the inferiour Captaines were all of the Nobilitie and honourable bloud, and the verie private Souldiours and the men at Armes almost all Gentlemen, which commonly indeede happeneth when a king himselfe goeth in person, or sendeth an honourable Generall of great account and habilitie. And contrariwise whereas the Commanders of Armies, either for sparing of charges, or for anie other private respectes, shall happen to be permitted vnto inferiour persons (especially such as are prodigall and needie, and therefore enforced to be Scrapers and Extortors, without regard of their own credite and repu-

tation, ye shall alwaies see the inferiour Officer and Captaines sutable, and so the successe full of shame and confusion. And the very principall cause of the good or ill successe of anie warre or exploit, consisteth chiefly in the good or ill choise of the chiefe Commander: for *Qualis Rex, talis Grex*, is a rule almost infallible.

Above all thinges let him loue and feare God, & cause true Chyistian Religion in his Armie to be had in due reuerence, in such sort that his Souldiours may perceiue he is indeed Religious. And let him by all meanes cause the Ministers of Gods word in his Armie to retain their dignitie, and to be esteemed and reuerenced of his Souldiours. For if the verie Paynims by due obseruation of their sayned Religion did keepe their Armies in marvellous obedience and order, how much more shall true Religion deliuered from the Almighty Lord of Hostes, anayle a Generall and Armie that loueth him, to the atchieuing of myraculous Victories.

He ought to be Modest, and Temperate, not giuen to Riot or excesse, neither miserably bent to filthy Lucre: but preferre his honour befoze all wooldly substance. No vaine Vaunter, neither to vendicate wholly to himselfe the praise of good successe, but to impute the same first to God, & secondly to his Captaines and Souldiours that serue vnder him. And this Modestie, & Temperance shall not onely make his honourable Actions shine the more gloriously, but also wonderfully combine with hartie good will his Souldiours to loue and honour him.

He ought to be a man of great Patience and Constancy in tolleration of labour and Misadventures, neither dismayd with ill successe, nor puffed vp with the contrarie, but heedfully to lay hold on all occasions, and carefully to prosecute the good successe, and preuent the contrarie, that neither in Miserie he be found Abiect, nor in victorie Insolent.

Wholly

Briefly, he must be Religious, Temperate, Sober, Wise, Valiant, Liberall, Courteous, Eloquent, of good Fame, and Reputation: learned in Histories, and in those Sciences and Artes y may inhable him of himselfe, without directions from others, readily to conceave and iudge of Militarie actions of all sortes, wherein the Sciences Mathematiceall, of all other for this honourable person are most requisite to be embraced.

A Nobleman or Gentleman trained by in these sciences. and indued with these vertues, shall farre sooner attain to that perfection which in a Generall is needful, then a person vnlearned. And most barbarous is the opinion of such as suppose Letters and Armes cannot wel stand together. For infinite are the Examles where Letters and Armes haue ioined together, even in the most famous and worthy persons of the world.

Was not Alexander the great trained by in Philosophie vnder Aristotle? and had the Ilyades of Homer in such veneration, that he neuer trauelled, or rested without them.

Hanniball also that famous Enemy of the Romaine Empire, was trained in the Greeke, the only learned language of that time, and left at his deach a Booke of hys owne making in the Greeke tongue. And when he prepared to innade Italy, of purpose procured a learned Grecian to Leade, Guide, & Discipline his Armie, by whose learned Counsels he vanquished so manie famous Romaine Confuls.

Alcibiades a man of maruellous Proewe among the Grecians, and so rare a Souldiour that Victorie did alwayes followe him what part soeuer hee did take, either with his Countrey or against it, was also trained by in learning vnder that graue Philosopher Socrates.

Scipio Africanus the finall Restorer of the Romaine libertie, and subuerter of the Carthaginians, who gaue
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the notable ouerthrowe to that famous Hanniball, was likewise Learned, and did no lesse esteeme of Xenophus booke of Cyrus, then the great Alexander of Homers Iliades.

Iulius Cæsar the first founder of the Romane Empire, and one of the most renowned Souldiours that euer the Earth bare, was also singularly Learned, as appeareth by his conference with the Egyptian Philosophers about the Theoricke of the Sunne, and rectifying of the yearely Reuolution, wherein, as among Souldiours for his Dexterity, so among Mathematicians for his Science he is registered, and to this day those Solare Reuolutions or reformed yeares do beare his name, and are among the Astronomers called *Anni Iuliani*. But if no other Testimonie of his learning remained, his owne Commentaries sufficiently argue how learned a man he was, which work perhaps hath made him no lesse famous, than all other bys honorable Actions,

I omit Epaminondas, Agesilaus, Fabius Maximus, Augustus Cæsar, Themistocles, and Silla, all famous Generals, and men excellently Learned: For infinite are the Examples, I might alleadge to proue this Argument: but in a matter manifest, it were vaine to produce more witnesses. And this by experience I finde, that it is onely the grosse ignorant, and ruder sort that hold this Opinion: For the most Famous Souldiours this day in Christendom I knowe are of another minde, and doe chiefly esteeme of learning and of learned men.

And God sparing life, I doubt not to make it apparant to my Countrey-men, aswel in the Art of Fortification, as managing of great Artillerie, and sundrie other principal points of Souldiourie, that the Sciences mathematical are most necessarie, and may not be missed in such a Noble man or Gentleman, as will aspire indeede to the perfection of Souldiourie,

Expe.

Experience also in a Generall for the learning of many particularities, is a thing verie requisite : and yet in respect of y^{e} which by Letters also, I meane Histories, and Sciences, may be attained, there is no comparison. *Multo enim latius circumspicit Mentis quam Corporis oculus* : And in one yeare may a man by reading knowe moze sundrie sorts of Embattayling, Encamping, and Fortifying, moze Stratagems and Pollicies by famous Generals put in execution, moze good Ordinances, Lawes, and Discipline for keeping Souldiours in Order and Obedience, moze rare deuises of Engines, Pyres, and like Militarie Inuenti-
ons, the is possible for him to see in an hundred yeares experience. And moze perfection for Militarie gouernment shall an Alexander, an Haniball, a Scipio, or a Cæsar trained in learning, in two yeares Experience attaine, then some ignozant vnlearned person in twentie.

Hereof it cometh to passe that some one albeit he be a person of body strong, lustie, and couragious, hauing bene twentie yeares in the Warres, shall haue little moze in him than to discharge the dutie of a Priuate Souldiour. And some other shall be by Nature of that Spirite and life, and by learning of that Capacitie and Dexterity, that with a few yeares Experience he shall be worthy to be a Councillour to anie famous Generall. But *Dignior est qui pollet. erog.*

And therefore an honourable person, meaning to become a perfitte Souldiour, after he hath by Science enriched his mind and vnderstanding, to satisfie also common Opinion, I would haue him by vse, practise, and experience, enforme his senses, and inable his bodie. And this caused the Antiquitie to portray the Statues of their Emperors with a Booke in one hand, and a Sword in y^{e} other.

If Kings and Princes in this sort, for knowledge, Vertue, and Valure, would make choise of their Generals, they should not need to restraine the within so narrow bounds

by their Commissions, but leaue the managing of the warres with moze libertie to their Discretion, who fronting the Enimie, and being alwaies in the Field present, shall euermoze be able to make farre better Resolutions, then the grauest Senate, or Counsell of the woꝛld absent, especially in these Militare seruices, where many times suddaine Resolutions are required, and no time foꝛ Deliberation admitted, seeing such Occasions sodainly may be offered, as if presently they be not accepted and pursued, in vaine afterward shall they be expected.

First therfoze, befoze the Generall receiue his Patent, it shalbe requisite foꝛ him to vse the Counsel and aduise of certaine choyse men, with whome hee may conferre of all circumstances concerning the Seruice, wherein he shalbe employed, and so accoꝛdingly make meanes to haue his Commission framed or amplified, and especially to regard that he haue as well allowance to rewarde the Vertuous and Valiant, as Authozitie to punish the vitions and cowardly persons. Foꝛ that Generall that is readie to correct the Offender, and not to rewarde the well deseruer, dischargeth but the moytie of his Office.

And soꝛsomuch as a Generall of the Field ought also to haue authozitie to bestowe honour and reputation foꝛ due desert, this is a speciall thing wherein the wisdom of a Generall is discerned. Foꝛ as it is fit to honoꝛ vertue, so to bestow it on base or vnwoꝛthy persons, foꝛ fauour or anie other priuate respectes, doth not onely make the persons ridiculous that receiue it, but greatly dischargeth the Generall, and maketh men of right vertue and valne indeede, to contemne that which they shall see imparted to the vnwoꝛthy.

Also, that immediately vpon the receite of his Letters Patents, he haue due regard, that al his officers, Colonels, and Captaines, be men able to discharge their place & calling of themselves, and not such as sometimes are chosen
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by fauour without Vertue, who being assigned to direct others, had more need to seeke some other to direct themselves. For herein chiefly consisteth the valour and Wise-
dome of the Generall, to be able by conference to make due examination of mens habilities, and according to their Capacitie and Vertue, to commit charge vnto them: for that Generall that iudgeth onely by apparance and report, shalbe extreamely abused, seeing it falleth often out, that men of great Fame by due triall are found of small sufficiencie.

It is also the Office of the Generall, not onely to see that his Colonels and chiefe Officers haue their Pay and Furniture but also that they impart the same duely with their Souldiours. And if one quarter of the pay were committed to the custodie of their Ensigne bearers, neuer to be answered the Souldiours till the end of the Warres, it would worke manie good effectes.

The Generall ought not onely to see good choyse made of the Marshal, the Lieutenant of the Horsemen, the Treasorer, the Maister of the Ordinance, the sergeant Generall, the Scoutmayster, the Maister of the carriages, of the Victuallers, Miners, and Pioners, &c. but also to reuiue the election of euery of his Captaines and their Officers, to allow or alter as he shall see cause.

Also, if there happen to be vnder his charge more Nations then one, it shalbe requisit (to auoid Enuie and Contention) that he elect certain choise men of euery Nation, to be of his Counsell, with whome he should debate of euery Enterprise, and heare their Opinions at large, but his Resolution should be so secret, as none or very few should be made partakers thereof, before the execut on.

The place of Assemblie where the Armie should first Muster, should be appointed in some wholesome scate of some fertill Countrey, that at the beginning the Souldiours be not discouraged neither by Sicknesse nor Penurie.

Here ought also the Generall to see and examine euerie Officer, whether they haue a sufficient Proportion of Armour, weapon, Shot, Powder, Artillerie, Boates to make Bridges to passe Riuers, Spades and Mattocks, and euerie other particularitie, befoze they once begin to march forward.

Here ought also the Generall to assemble his Counsel, and to ordaine Statutes and Lawes for the gouernment of his Souldiaries, first communicating & same with his Coronels and Captains, causing them also to impart them to their Bandes, suffering euerie man franchly with due reuerence, to speake, object, and by writing if they list, to offer vnto any of & Counsell what they can against any of them, which Obiections considered, they shal resolue vpon those Lawes and Penalties, and then cause euerie Coronell and Captaine to take his Oath, and they likewise to cause euerie Souldiour at the Ensigne to take their othes, to obserue, and as much as in them shall lie, to cause to be obserued euerie of these Lawes and Edictes so agreed on. This done, the Armie may begin to march, whensoever the Generall seeth occasion.

The Generall is by good, especiall, and perfite Plattes, Mapps, and Models, to know the Scituation, Nature, and propertie of the Countrey, and his partes, where he is to passe with his Armie, whether it be plain and Champion, or wooddie, and full of waters, furnished with strong Towns, or contrarie, accordingly to proportion the horsemen and footemen of his Armie: for if it be mosse part Champion, and full of Forrage, it is meete to haue the moze Horsemen, if contrariwise, it standeth vpon straits, and fortified places, he is to haue the moze Footemen.

Light Horsemen are in all places for Discoverie, fetching in of Booties, and pursuing of Victorie, verie seruiceable, and by no meanes to be spared.

The Generall ought also by good especial to learn how to
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I like well to have some Carriages allowed in pay, to attend on every Bande of Footmen, as well as on the Horsemen, who besides the Carriage of necessaries for the Souldiers use, may also in time of Skirmish, and other Encounters, serve to carrie hurte men out of the field.

The Generall may allow euery Coronell, Captaine, and principall Officers in the field, certaine Gentlemen extraordinarie, which shall be select persons, able to discharge euery Office vnder them, and also to supply their places in euery suddaine, and for such to haue good pay and allowance: but for Dead Payes I hold them not conuenient.

The Generall ought also not onely to haue expert Enginers, and men of excellent knowledge in the Arte of Fortification, both of Fortes and Campes, conducting of Mines, planting of Batteries, &c. but also to haue therein himselfe requisite knowledge, otherwise shal he be misled by fantastickall deuises of such as pprofesse and vaunte them selues of the knowledge they are nothing gilltie, and purchase himselfe perpetuall Dishonour. And how much such a Generall shall surmount other, may appeare by the Prince of Orange, who by reason of his owne excellent knowledge in Fortification, hath himselfe bene the chiefe or onely Enginer to make so many inuincible Cities and Towns, as in Holland, Zeland, Brabant and Flaunders are at this day to be seene. And thereby onely or chiefly of any humane cause, hath bene able to make head against the most famous Souldiers, and Gene-

The Art of
Fortification
a studie for a
Generall.

The Prince of Orange.

rales of Christendome, and reduced the Countrey frō most abeitt ffortune, to the state we may p̄sētly see, contrary to all expectation.

A Generall ought to haue, good consideration of h place where he meaneth to encamp and continue, that it be not in an vnholesome and infectious aire, but that his Souldiers may lie on drie ground, & yet not far distant frō wood and water, the which are so necessarie as in a Camp may not be spared. And if he perceiue sicknes in his Camps to increase, the best remedy is, often to remoue, and to encamp vpon hilles and drie ground, and to gene strait order, that al garbage of beastes, and other filth be interred, and the Camp p̄serued as swete as possible may be.

He is to gene order that his souldiers be kept in Exercise, either in marching and trayning, or in some kinde of Militare labour, which shall not onely enable their bodie in strength and agilitie, but also p̄serue them in health.

He should, while faire weather is, acquaint his Souldiers to rest and sleep on bare ground: and though the enemy be far absent, yet duely to maintaine their Scoutes to Watch and Ward, and perfoyme all other Militare orders, no lesse curiously then if the Enemy were still p̄sent, whereby it shall not seem græuous, when necessitie shall require it.

He is also befoze he encamp to consider, if he haue abundance of horse, that there be good stoe of Forrage nigh the Campe, otherwise, in foraging far of, he may greatly hazard his Companies, if good Conueys be not sent with his Foragers, and their iorneyes discreetly directed.

Good regard must also be had, that the Campe be not subiect to any hil, from whence the enemy may beat with great Artillerie, nor so disioyned from water, that the enemy may easilie cut you from it, neither yet so lowe as the enemy, by cutting the bankes of any Riuer, may drowne the Campe.

If there be no great Rivers, but onely small Fountaines or Welles to water your Armie, then must good watch be kept, that they be not by the enemye poisoned and infected.

The Generall should not so much seeke to place his Campe in seates strong by Nature, as to fortifie them by Arte, as wel to keepe his Souldiers in Action, and from idlenesse (the only ruine of Armies) as also that due order in Campes may be mainteyned. And therfore let him imitate the auncient Romanes, the very masters of the Arte of Warre, who neuer coneted other then the Plaine to encampe vpon: Entrenching themselves nightly in no lesse strong and sure maner, then if the enemye had encamped by them, and that euen in places vtterly boyd of all suspicion, to make these Militare Trauels familiar to them, and to auoide those idle, or rather dissolute Effeminate practices that our Christian Campes are bewitched withall; to the vtter ruine of all good Militare Discipline, and confusion of our Armies.

Metellus in
Affricke.

The Generall ought for auoyding of Mutinies, and all disorders within his Campe, to haue his statutes & lawes openly Proclaymed, and set vp publicquely for euery man to read, with the pain to euery offence assigned, & the same seuerely to be put in execution on all offenders, without any respect of Persons.

In a running or moueable Campe the readiest Fortification is to impale it round with the Carriages chained together, bending the Artillerie that way, where most suspicion is the Enemye shall approach, and if time will permitte, to cast some Trenches also without the Carriages.

The old English incamping.

This policie vsed the Duke of Alba in the late Flemish warres against the Prince of Orange, who invading with a great power of Horse, and finding the Duke of Alba almost all Footemen, impaled with Carriages, was neuer

Duke of
Alba.

able to geue him Battaile, and in the end for want of Forrage and Victuals, was dzinen to retire.

He should see his Souldiers kept in continuall Militaire Exercise, and by fained Alarmes to see in what readines his Bandes would be if necessitie required: To thewe them all manner wayes how the Enemy may attempt them, discovering to them also the remedie, and how they are to answer those attempts, for no man is bozne a Souldier, but by exercise and trayning it is attained: and by discontinuance againe it is lost, as all other Artes and Sciences. Neither is there any Nation for Militaire Actions so honourable, as by rest and discontinuance will not grow Effeminate and Reproachfull: nor any Nation by Nature so abiect and base, that by a worthy General, with Trayning will not produce good Souldiarie: as by infinite examples of Antiquitie may be approued. And in these dayes we haue seene the Flemings, a people by reason of their Rest, Riches, and Delicate life, contemned, and no valure for Armes supposed in them: Yet since the Prince of Orange hath put weapon into their hands, and trayned them, they haue not onely defended themselves, but also in sundry exploits geuen the famous Spaniardes great foyles. Such is the valure of a graue wise General, as is able to change the Nature and Fortune of an whole Nation, *Annunte Deo.*

In setting of a Camp, besides the commodities of wood, water and Forrage, the Generall must also consider how Victuals may safely come vnto him, and to leaue no Castles at his back to annoy them, but that he seek to posses them befoze he march forward: for great is the annoiance that a little Pile at the back of an Armie may do, as well against Forragers and Straglers, as to cut off Victuals from the Camp.

The Generall is also by good Plattes to consider the Scituation of the Countrey, how, both the Friend and Enemy

No man
borne a souldier.

No Nation
by nature alway Militaire.
Trayning
makes Souldiers.

The Prince
of Orange.

nemie Townes lye from his Campe, the Hilles and Val-
 leys, Wayes, Straights, & Passages, Lakes, Riuers, & Bridges,
 their number, quantitie, distance, and euery particularitie,
 which may be done by conference with his Guides, and o-
 ther persons that know the Countrie, conferring their as-
 sertions with his Plattes: And so to consider, whether the
 Enemy may conueniently send out to cut of his Victual-
 lers, or by Ambush annoy him in his March, and for pre-
 uention thereof to send abroad both Light Horsemen and
 Harquebuziers to gard the Straights & passages, towarde
 the Enemies Garrisons. Herein is Iulius Caesar singularly
 extolled by Suetonius Tranquillus, to surmount all other
 for choosing his ground to March, Encampe, and Fight vpon:
 Wherein by the singular knowledge he had, both in Geo-
 graphic and Astronomie, he would prudently forecast all
 annoyances of Sunne, Winde, and Weather: The nature
 and Scituation of the Countrie, of Riuers, Hilles, Valleys,
 Woodes, Straights, & such like, by Geographicall Cartes
 & Mappes exactly made. And hereby also hath the Prince
 of Orenge in these late Flemish warres greatly aided him-
 selfe: For hauing of Holland, Zeland, and all other partes
 of the Low Countries very perfitt and exquisite Mappes &
 Plattes, he was able at one time in sundry partes to giue
 Direction which Straights should be garded, what places
 Fortified, which Leuels might be Drowned either by Sea,
 or fresh waters. And thereby often auoyded present & im-
 pendent perils, and contrary to all expectation, hath ro-
 ted out the Spanish Enemy of so many strong Fortes and
 Townes by them possessed.

Iulius Caesar

The Prince
of Orenge.Geographie
for a Souldi-
our requisite

Before the Armie discampe, all Passages & Wayes for
 the Souldiers and Artillerie &c. to passe, should be discou-
 red, and skilfull men appointed to lead them, which of the
 Romanes were named *Campiductores*.

He ought not to suffer any Bande to march scattered,
 but in order of Battaille, or at least if Straights & narrow

Passages inforce to draw them forth in Herdes, and presently so sone as place serueth to reduce them againe into order of Battaile: And this is to be vsed as well in places of Securitie, for Exercise and Reputatiō, as in places of Suspect for safetie and Defence.

He ought to haue with him good Guides, that perfectly know all particular Passages, Hilles, Valleys, Woodes, Riuers. &c. for of the Countrie in generalitie the Generall himselfe ought perfectly to be informed by Plattes & Models, whereby also he shall the moze readily conceiue any information that shall be brought him by espiall.

If the Generall haue sundry Natiōs vnder his gouernement, it is not mete to giue alwayes to any one Nation the Vaward, considering (the same being in marching towards the enemy the place of greatest honour) the others will much repine against it, & not without good cause: The order therfore of Marching should in such sort be framed, that euery Nation should haue his turne without partiall fauour to any one. And if the number be great of any one Mercenarie Nation, it is not amisse to deuide them both in Marching and Imbattelling for sundry respects, which in this place I omit to declare.

Observed by
Count Bos-
sute, and
Monsieur de
la Nouë in
their Ordi-
nance. 1578.
in Braband.

If any Straight be kept by the Enemy, it is not mete first to charge them vpon the very Front, but to send Light Horsemen & Shot to skirmish with them on either Flanke, and then with Targets of Proofe to enter vpon them.

Pastimes for
a Generall.

The Generall should before he bring his Souldiers to deale with the Enemy, first in some plaine and Champiō place, cause them to be rāged in forme of Battaile, making of his Footemen sundry Battallions: And of these Battallions sundry Frontes, to deuide his Horsemen also into sundry Troupes, placing the men at Armes, Demilaunces, Light Horsemē, and Argoletiers euery sort in seuerall Troupes by themselues, to cause the Forlorne Hope to issue out and skirmish before the Battallions, as if the Enemy were in
deeds

be present, and vpon a Signe giuen, sodainely to retire. The Horsemen to charge & retorne againe to their place, vpon their retire to cause certaine files of Pikes, and light armed, to runne out to their Rescue, as though the Enemy did pursue them. When the Battallions of the first Front to march forward, and bend their Pikes, and sodainely after sound of the Retreite, to retire themselues orderly betwene the Battallions of the second Front: When that second Front to march forward and bend their Pikes, and the other that first retired to make head agayne vpon the Enemy: Last of all, the Light Horsemen, & Light Armed Footemen agayne to breake forth as it were to do execution vpon the Enemy Flying.

Trial of trained Souldiers.

These things, if in pastime they be able readily and orderly to performe, there is good hope they will honorably put it in execution vpon the Enemy: Otherwise, to bring them without this former Trayning to deale with the Enemy, is nothing els but to lead them to the Butcherie.

It is aboue all other things, for a Generall requisite by all meanes to animate his Souldiers to Frugalitie in expences & Tolleratiō of Labour: for it is not the wild, rash, fantastical head, but the sober obedient minde, & the hard painfull body that maketh the noble Souldier. And nothing more continueth the Body in Health & Strēgth than Exercise. Sundry sorts therfore of Militare Actiuities and Traynings the Generall should deuise, & enioyne his Colonels & Captaines to keepe their Souldiers in continuall Actions, for the Body of man is in qualitie like yron.

What Natures proue Souldiers.

Pulchrum est usu, cessans rubigine sordet.

Let the Generall consider the nature of the Enemy, Nations with whom he dealeth: If they be of Delicate Bodies, not hardened in War: Or if he perceiue that Victuals fayle them, Or that sicknesse encrease among them, let him in any wise abstaine from Battaille: for more assuredly shall

¶ b ¶

be that way preuaile. And as honourable do I iudge the Victorie to the Generall, by that Pollicie attained, as if by the blond of his Souldiers he should atchieue it.

There is nothing more perillous in giuing Battaille, than to lay befoze the Souldiers eyes any place of Refuge to flye vnto: But rather should the Generall declare vnto them, that there is no hope to escape, but onely by Victorie, and herein to imitate the proceeding of Hanniball against the Romanes.

There is nothing more Barbarous than in giuing Battaille to comit all to the hazard of one Fortune or Encounter. But in such sort diuide the Regiments, that if one be defeated, there may remaine others in order to charge vpon the Enemie, who following Victorie with disorder, as commonly it is sene, if they were but the third part of their enemies number, yet may they recouer the field againe. And in this to imitate the Romane Discipline, who euer so ranged their Armies, that Fortune must at the least thise abandon them, and fauour thise their aduersaries, or els they could not be vanquished.

In this case
did 6000.
English de-
feate 60000.
French at
Poitiers.

There is nothing more perillous than to giue the Enemie Battaille in such place where hee hath no Refuge or Possibilitie to escape, for that Necessitie maketh men Desperate, it vniteth them together: And it hath often bene sene, that very small companies by such like occasions being reduced to Desperation, thereupon resolving to sell their lines dearely, haue contrary to all expectation attained Victorie vpo their Enemies in number farre greater.

Collonels, Captaines, and such principall persons ought not to be thrust in Ranke as Priuate Souldiers, but being at libertie, much more ought they by Head and Tongue to direct, than with Hand to execute, albeit sometymes in cases of extremitie, they are to execute with the Hand also: but in day of Battaille to put all the principall Officers into the first Rankes, where they can doe no more than Priuate

Private Souldiers, it is Barbarous, and by an Honorable wise Generall by no meanes to be permitted.

Footemen lightly armed, both Pikes and short weapon, as swordes and targets to mixe with Shot, are of great service. Verie famous Generals, finding themselves ouer matched by Horse (their Enemy in Cauallarie far surmounting them) haue in the day of Battaille giue order, that certaine Troupes of these light armed should assist their own Horsemen: and after the Charge was by them receiued, these Light Armed should with a cry in great furie breake vpon the Enemies Troupes of Horse: And haue by that meane not onely rescued their owne, but also so broke and chased the enemies Cauallarie, that contrary to all expectation, thereby onely they haue defeated them, & wonne the field: A Pollicie to be reuiued where the General shal find himselfe in Cauallarie too weake.

These light armed Footemen should be trained of purpose to fight among Horsemen, to follow the Enemy in Chace, & yet vpon any sodaine to vnite themselves againe in one Bodie, to abide a Charge, and sodainly againe to breake and follow the Chace, and oftentimes to reiterate the same, to put the like in execution against the Enemy when occasion is offered, which by Practise right well will be attained, how strange soeuer now for want of vse in these dayes it may seeme vnto vs.

The Romanes vsed a kind of Forlorne Hope or Skirmishers called *Cursores* or *Proclustas*, which they diuided into three sortes, *Antistites*, *Cornistues* and *Tergistues*, neither would they euer turne out any of these to skirmish, but that they were backed with Armed men, Pikes, swordes, and Targets, or such like: And these they called *Vindices*, Reuengers or Rescuers: And this should also euen in these dayes with our Shot be practised, as well to gard them from the Charge of Horse, as to aid them if they should ioyne pele mele with their Enemies: As the Spaniards

Cæsar against Pompey.

Scanderberg against the great Turke.

Received by the Spaniards.

Skirmishes
to what end.

hane of late dayes begunne to practise.

Skirmishes should neuer rashly be made nor vsed at any time, but to some end and purpose, as to Discover, or win some ground of aduantage, or some Straite, or besoze the battaile to giue Souldiers courage, by giuing the Enimie some Foile: but the leading of such a Skirmish, ought to be committed to some sober, wise, discret, valiant Gentleman, who either by laying secret Ambushes and Receites, or by some other Train and Pollicie may be assured to giue the Enimie some Foile. For that kind of Fleshing the Souldiers besoze the Battaille, is a matter of great importance, not onely to them that were present at the Skirmish, but also to the whole Armie, who by their example will take Courage and Boldnesse. And as a Generall ought by all meanes to seeke this aduantage, so ought he to be as warie that his Enimie get not the like vpon him: and to preuent the same, must giue commandement, that no man vpon paine of Death be so hardie as to enter into Skirmish with the Enimie, without expresse commandement from himselfe or some of his principall Officers.

Note Iulius
Cesar after
his battaile
at Durazzo.

As a Generall ought neuer giue battaile to his Enimie, without great and apparant reason either of Aduantage or Necessitie, so is he chiefly to abstaine, if he perceine his Souldiers to hane conceined any secret feare. And herein greatly auaieth the wisdom of the Generall, to discerne the nature and disposition of his Souldiers, and by comfortable and couragious words to animate them, and (as hath bene said) by Skirmishes of aduantage to Flesh them, and by continuall Trayning to make them know their strength and aduantage of their Orders and Discipline: And by no meanes to giue entire Battaille, till he haue by some of these or like meanes banished all feare from them. For there is no Enimy sooner ouerthrowne, than he that will accept Battaille whensoever it is offered, as by
many

many Presidents may plainly be approued.

If in the Winter time the Enimie present Battaille early in the morning, our General by Skirmishes should delay and prolong the time as long as he may: and in the meane time cause all his Souldiers, especially the beaute armed, to feede and refresh themselves with meate and drinke, and then bring them to deale with the Enimie, whom if they finde with cold and fasting weakened, there is great likelihood of good Successe. By this meane onely was there one great Army of the Romanes at the river of Trebes vtterly ouerthrowne, by reason their Generall being ouer much desirous to giue Battaille, brought forth his Armie to fight, not suffering them to stay the feeding and refreshing of themselves befoze hand.

It were conuenient to appoint certaine Carriages and men, of purpose to giue their attendance in euery skirmish and incounter, to carry away their hurt men to such place as Surgions may immediately repaire vnto them, which shall not onely greatly incourage the Souldier, but also cause the Skirmish to be the better maintained, when the Souldiers shall not neede to leaue the field to carrie away their hurt men. These were called among the Romanes *Despotari*. And this among many other laudable Romane orders haue the Spaniards at this day reuiued and put in practise, whereby also they conceale from their Enimie what losses in any Skirmish they haue receiued, a matter of no small importance.

Hannibal that famous Generall, would seldome or neuer giue Battell, but he had befoze hand inuēted some Pollicie to giue terroz to his Enimies, by some sodain attempt of secret Ambushments, either on their flanke or Back, accommodating his deuice to the oportunitie of the time & place, which in his last Battell with Scipio he could not so well do, by reason the place was plaine and Champion, where onely Magnanimity and good Discipline might pre-

Reuiued by
the Spaniards.

Hanniball &
Cæsar Pat-
terns for a
Generall.

The General
in the day of
Battaile.

It was not
lawfull for
the Romane
Dictator to
be mounted
on Horſe.

uaile : wherein the Romanes being nothing inferiour, he had not that fortunate ſucceſſe, which in many other battels he had againſt them. A worthy Generall therefore ſhould borrow both of Hanniball his ſubtile Stratagems, and of the Romanes their Warlike Orders & Diſcipline: And in execution of ſuch Pollicies, Secrecie is aboue al other things to be reſpected: for as there is no Stratagem ſo excellent, which being knowne, the Enimie may not pzeuent, ſo is there almoſt no deuice ſo ſimple, that being ſecretly kept, and ſodainely put in execution, but it will worke ſingular good effects.

To the Generall of the field it appertaineth, al the time of the battaile to giue order, when the ſkirmiſhers, or Forlorne Hope ſhall retyre, and to what places: When the Horſemen ſhall charge, what Troupes either of Horſemen or light armed ffootemen ſhal come to their Reſcue: What Battallions ſhall march ſoꝝward, when they ſhall retyre, when the light armed ſhall purſue the Victorie. For this and all other accidents that may happen during the time of battaile, the Generall ought attentiuely to giue order from time to time what ſhall be done: And that as wel by Meſſengers which ſhall alwayes attend vpon his perſon ſoꝝ that purpoſe, as by the ſounds of the Trumpet and Drummes.

And albeit ſundry be the Opinions of ſouldiers touching the Place of y General in the day of Battaile: Some would haue him mounted on Horſebacke, others on ffoote: Some in the heart of ſome Squadron or Battallion neare the Enſigne or Standarde: Others at libertie not tyed to any place certaine. And ſoꝝ confirmation of euerie of theſe Opinions, the Examples of very worthy Generals may be alleaged. Yet bzeſtly to ſet downe vpon conſideration of ſundry Diſcourſes that I haue heard & read, what I thinke beſt, I ſay, I would not haue the General mounted on any pꝛincipal Horſe of Seruice, but vpon ſome Nag, (I meane ſuch

such a General as is strong in footmen) neither to put him selfe into any Battallion or Squadron, but being accompanied with a reasonable strong Guard, and certaine verie sufficient Gentlemen likewise mounted vpon Nags, to passe from place to place, from one Battallion to another, during the time of Battaille, prescribing continually what he would haue done, sending of these Gentlemen to deliver his meaning and commandements to such Officers as are to see them presently put in execution. And neuer to put himself into the bodie of any Battallion or Squadron, vnlesse he see the Enimie so preuaile, that his Skirmishers and light armed be beaten in, the Battallions of his former Frontes retired, and that the matter is reduced euen to the last fight: Then may the General either dismount, and enter into some select Battallion, to make the last trial, or into some principall Squadron of Horse, to giue order for the retire of his people, and safegard of his person, if he see no other remedie.

If the Enimie haue new aid, and supply of men coming vnto him, then ought the General to seeke al means to giue him battaille, befoze both his powers ioyne: Or if Victuals and Pay begin to faile vs, or be likely to grow dayly moze scarce among vs, our Generall should neuer refuse Battaille, if any oportunitie be offered: But otherwise, if our General expect further supply, or that our enemies Victuals faile them, or Sicknesse increase among the, let him stand strongly vpon his Guard, but by no meanes ioyne battaille with them so long as he can conveniently auoid it.

The Experience hereof was lately seene in these Flemish warres. 1578 betwē the States and Don Iohn D' Austria, who vnderstanding of the coming of Duke Cassimere with 5000 Ruiters, and 6000 Footemen offered the Army of the States battaille at *Rymenant*, where they lay encamped to expect Duke Cassimers coming. But Counte Bossute

The Place & duetic of the Generall in the day of battaille.

The Romans against Hannibal and Al druball

Don Iohn & Counte Bossute at Rymenant.

Generall of the States Armie, albeit both for Footmen and Horsemen he was well able to haue fought with him, yet gaue he straight order, that none of his armed should stir out of the Trenches, but onely the Shot, and certaine Horse to guard Passages, and maintaine Skirmish: so that Don Iohn finding his expectation deceiued, and that he could not traine them forth to the Battaille, was driven to march away. And this Temperance in the Count Blosset was no lesse Soldierlike, than the other courageous attempt of Don Iohn, both being done with great reason.

If at any time, by reason the General perceiueth his aduersarie ouer strong, he thinke good to march away to places of more strength, he should so vse the matter, that his Souldiers by no meanes vnderstand or suspect, it is done to auoide Battaille, but rather to signifie vnto them his intention is to retyze, to the end he may draw the Enimie vpon his Ambushes, or into some ground where he may giue them Battail to his better Advantage, for otherwise the Retire may strike so great a Terror into the hearts of his Souldiers, as hardly after will be remedied by any perswasions.

If the Enimie vpon our retreite pursue vs, the General must giue order to lay sundrie Ambushments of Shot to guard Straits and Passages, & also to leaue certaine Troups of light Horse and others by skirmish to stay them, while the heauie armed may march away. But if the Enimie pursue vs so fast, that our armed Fanterie cannot march away in Militare order, let the Generall prepare to giue them battaille, and rather chosse to put it to that honorable trial, than in any iote to breake his Militare orders, or by disordered March to strike a feare in the hearts of his Souldiers.

Befoze the Battaille, the General must giue commandement vpon paine of Death, that no Victualler, or other person

person whatsoeuer shal depart away, during the fight. And some famous Generals haue appointed certaine Troups of Horse of purpose to attend and do execution on any such as they should perceiue to breake or offer to escape away.

It is no small aid in the day of Battaille to get the Sun, the Wind, and the higher ground of the Enimie, for these being on our side, and against our Enimie, they fight for vs, and albeit they same matters of small importance, yet the wisest and valiantest Capitaines haue not a little respected them.

Some haue in the day of Battel caused certain of their owne Bands, to reuolt to their Enimie, who afterwards haue bene no smal cause of their Victory. As Hannibal against the Romanes in the battaille of *Cannas*.

Some in the time of Battel by corrupted espies or otherwise haue caused rumour to be spread in the Enimies battaille, that their Generall was slaine, or some part of them defeated, or flying away, and thereby so amased them in the midst of the fight, that they haue swayed and broken. But this must be done on the contrarie part of the Battaille, where the Generall is not to be seene.

Some haue caused certaine of their owne Troupes euen vpon the first encounter to breake and runne away of purpose, to the end the Enimie might follow the chace vpon them with disorder, and so fall into the handes of other Troupes standing orderly to receiue them.

Some hauing enuironed their Enimies round about, and perceiuing that the same hath made them more desperately to fight, and resolutely to stand to their Defence haue of purpose opened and made away for their Enimies to flee: And by that Pollicie onely haue had the chace and slaughter of them, that otherwise would dearely haue

Fi y

Attilius a
Romane C6-
sul.

Philip King
of Macedo-
nie against
the Scythi-
ans.

Hannibal a-
gainst the
Romanes in
the battaille
of *Cannas*.

Marius a-
gainst the
Cymbri.

Musclebo-
rough field.

T. Quintius
Capitolinus.

Iulius Caesar
in France.

Hanniball a-
gainst the
Germanes.

sold their liues, or perhaps haue got the Victorie. As a small Troupe of our COUNTRYMEN did vpon the French in the like case at the Battail of Poytiers, where albeit they were not a tenth part of their enimies number, yet being enuironed, hauing no place of Refuge, and therefore resolued dearely and honozably to sell their Liues, contrary to al expectation, they had Victory, and tooke Iohn the French King Prisoner, with the slaughter of a great multitude of his Nobilitie.

Labienus in
France.

Some seeing their Enimie desirous to passe a Riuer, to giue them Battaille, haue seemed for feare to march away, leauing secret Ambushes, and when they haue perceiued a good part of the Armie past the Riuer, haue sodainely turned againe, and defeated them befoze the residue were able to passe ouer to their rescue.

King Iuuiba
in Affrike a-
gainst Curio

Some abounding in Horsemen, to draw their Enimie into the Champion, haue offered Charges, and thereupon fained a flight, therby training the Enimie into the plaine, where they haue defeated him, whom in Straites they were neuer able to encounter.

Thomiris
Queene of
Scithia a-
gainst Cyrus
200000.
horsemen.

Some leaders of Footemen haue also by faining flight, trained their Enimies Cauallarie into Straites, & there by secret Ambushes sodainely set on them, and defeated them, whom in the Champion they were not able to deale withall.

Fabius Maxi-
mus so vsed
Minutius, &
Sertorius
likewise vsed
his mutinous
souldiers.

Some finding their Souldiers ouermuch desirous to fight with the Enimie, when it was not by due respectes conuenient, and thereupon repining against the Generall for keeping them from Battell, to make them know their Error, hath of purpose suffered some part in attempting some rash enterprize to be defeated of the Enimie, and vpon that occasion made the rest vnderstande their fault, and become the moze obedient to his commandments.

Some

Some haue of purpose abandoned their owne Camp, as though they had fled for feare, leauing it full of wine & other Delicacies, and the night following, haue returned & set vpon these their Enemies, who thinking themselves in Securitie, and drownded in those Delicacies, haue bene reckless and vnprovided, and so by their Enemies when they least suspected, put to the Sword and vtterly defeated.

Some being pursued of their Enemy, euen to a Riuer, which they must either passe, or receiue Battaille, haue settled downe at the riuer side, entrenching themselves, setting vp some Tents, & sending abroad some Forragers as though they meant in deede to encamp. And their Enemies believing the same, haue likewise encamped and sent abroad their people to make provision: In the meane time those so pursued, vsing this occasion of their Enemies negligence, and the aide of the night ensuing, haue suddenly passed the riuer before the Enemy could dislodge and draw his people in order to giue them battaille.

Quintus
Lutatius a-
gainst the
Cimbri,

Some being in like sort pursued by a puissant Enemy, haue cast a Trench at their backe towards their Enemy, and filling the same with Wood and other matter fit to burne, haue set it on fire, and so stayed the Furie of their Enemy till they haue passed ouer.

Nabides a-
gainst the
Romanes.

Some to passe a Riuer, otherwise not passable, haue let it out by opening the Bankes into some lower ground, but the best is in an Armie Royall neuer to be without Boats of purpose, that chained together, shall presently make a Bridge: Whereof in an other Treatise among other Militare Engines I meane more at large to speake.

Some being frosted by their Enemy on the contrary side of a Riuer, whereby they could not passe ouer to giue him Battaille without extreme disaduantage, after they had sundry dayes together marched along the Riuer, they that desired to passe, haue in the night out of euery Band drawn a certaine number of choise men, whom they haue sent se-

cretly vnto the next Wooddes, with direction, that the next day after y^e Armies were departed, they should come downe to make and Fortifie their Bridge. The next day they haue both discamped, and their Enemy seeing the full wonted number of Bandes, Ensignes, &c. haue without mistrust of any such matter marched on, fronting their Enemy as befoze they were accustomed. But those that meant to passe, when they saw time, haue sodainely returned backe agayne, and finding their bridge made, Fortified, and all things in readinesse, haue passed without any daunger at all.

Vegetius
Rule.

Some to passe a Riuer, though wadeable, yet very violent and swift, haue caused their Horsemen, first in two places to passe and crosse it, and then the Footemen to passe betwene those Troups of Horse: y^e one Troupe breaketh the force of the water, and if any of the footmen happen to faile his footing, & be bozne away with the violence of the streame, yet the other Troupe of Horse may recouer him.

Monsieur
Laurek in
the king-
dome of Na-
ples.

Some hauing sundry Nations in their Armie, haue ranged euery Nation separately into sundry Battallions, and haue put in the forefront a Battallion of euery Nation, giuing it out in the time of fight, that one Nation had Victorie, wherewith the rest inflamed should likewise valiantly fight: and by this Stratageme a wise Generall, shall greatly ayde himselfe when he hath to commaunde sundry Nations.

Scipio a-
gainst As-
drubal.
Metellus a-
gainst Ser-
torius in
Spaine.
The Spa-
niards a-
gainst the
French at
Cyrignola.

Some when they haue perceiued their Enemies, by their labour & trauell, or hasty pursute, to be wearie, or by long standing in Battaille faint, haue euen then vpon that occasion sodainely set on them, and defeated them, as our Countrymen did the French at the Battaille of Cressie.

Some finding themselves too weake in Horsemen, haue retired themselves among Vines, Bushes and such like vneuen groundes. Others haue made secret Trenches, couering them with Hurdles, and Turffe: Others haue be-

led

sed Caltrops and Stakes. By these & many other meanes the ingenious Fanterie haue and euer will be Victorious against Cauallarie that rashly will charge vpon them.

The Carthaginenses, who many tymes had bene by Marcus Regulus ouerthrowen, at the last by the Counsell of Zantippus the Lacedemonian they became Victorious: who aduised them to descend into the Plaines, where by their Elephants and multitude of Horse, they ouerthrew the Romanes.

Some hauing with their Troupes of Launces sundry tymes chaged a Battallion of Pikes, and bene still repulsed with losse, at last haue caused all their Horsemen to Dismount, & encountring on foote, haue defeated the Battaille of Pikes, which on Horsebacke they could not by any meane breake or disorder.

Some in the day of Battaille perceiving their Enemy to haue reduced his principall strength to some one part, haue not to the same opposed likewise their strongest Battalions, but their weakest, giuing order, that when they came almost ready to encounter, they should retire, and suffer the rest to deale, and by that Pollicie first defeating the weaker, haue easily after dealt with the stronger, who being both inuironed of them, and also disordered, in pursuing those that of purpose haue retired, were without any great difficultie afterward defeated.

Some haue drawne their Cauallerie, & light armed, behind their Battallions of their heauy armed Souldiers, leauing betwene those Battallions sufficient space for the Horse to Charge, & Shot to Play, by which Noueltie, happening so contrary to common order, and their Enemies expectations, they haue attained Victorie.

Some haue brought befoze the front of their Enemy battaille a nuber of Carriages drawen with Oren, & laden with dry Woodde and other stufte fit to burne, and sodainly giuing fire vnto them, the Beastes to flye the flame at

The English
against the
French at
Egincourt.

Coruinus
Romane a-
gainst the
Samnites.
Count Car-
mignuola a-
gainst the
Switzers in
Italie.
Scipio a-
gainst As-
drubal.

Castruchio
against the
Florentines.

The Spa-
niardes a-
gainst Ha-
milcar.

their tayles, haue violently runne forward, & broken the array of the Enemie. Others haue used Hooked Wagons and other Engins, which of their owne Violence by secret inward Motions do worke the like effectes.

Sylla against Archelaus.

The English against the French at Egincourt.

Some aswell to resist these Engins, as also the charge of Launces and Barbed Horses, haue caused euery Souldier of the first Ranks of their battaile to haue Stakes of foure or fve foote in length, sharpe at both endes, and those to thrust into the earth, bending them towarde the Enemie, and to couer them with their bodies, till they see the Enemie giue the charge, then presently to retire, and receiue them vpon those ranks of Stakes.

Sylla in Capadocia.

Some finding themselves too weake to giue their Enemies Battaille, haue entred into Parle of Peace, seeming as though they were ready to yeld to any Conditions, and by that meane prolonged the time, till either they might haue further supply from their friendes, or oportunitie to march secretly away.

The Prince of Orenge against the Spaniardes in the Low Countries.

Some finding themselves too weake to giue their Enemies Battaille, haue dispersed their Souldiers into sundry Townes, and Castels, fortifying and victualling those their Holdes, and so by prolonging the Warres, consumed their enemies Treasure, and thereby dissolued the Armie, which otherwise they had neuer bene able to defeat. This Pollicie is best to be used when Winter draweth on, which in these Northerne Countreies is a sufficient Enemie to consume any great Armie that shall the while keepe the field.

Francis the French King against the Emperour Charles the first at Landersc.

Some hauing one of their Townes besieged, to giue them a supply of Men and Victualles, haue with their Armie marched on, vnting by espiall, that they meant to giue the Enemie Battaille, who presently hath leued his Siege, and marched on to meete him, the rather to auoyde Sallies out of the Towne on their backe during the fight: But so soone as by this policie they had
with,

withdrawen the Siege, and entred certaine Bandes with a proportion of Victuals, secretly the next night they dis-
camped, and marched away.

Some hauing summoned a Castle, strongly scituat vp, on an hil, enuironed with Marish, in such sort that it was thought impossible to bring the Cannon to batter it, and therefore the Captaine of the Castle refusing to yeelde except hee might see the Cannon: The Generall without hath secretly caused a Cannon of Wood to be artificially made and coloured, Hurdles to be laid vpon the Marishe. a number of Horse to drawe the Carriages, as though with great difficultie they had drawen a Cannon indeede, and then threating, that according to the law of Armes they should be al put to the sword if they did abide the battery. The Captaine of the Castle abused by this Stratagem, hath surrendred the Forte by Composition, which otherwise had cost a number of mens liues befoze they should haue gotten it.

Some determining to surprize one strong towne, haue first offered to lay siege to some other thereby, suffering it notwithstanding to be supplied from the other (which they meant indeede to besiege, with Victuals, Munition, and Souldiers: which done, they haue immediately bent their whole Forces vpon that Towne from whence these Supplies departed, and finding the same by this pollicie the more disfurnished, haue in shorter time atchieued it.

Some hauing a towne of their owne besieged, which they could not with their army conueniently relieue, by reason of riuers & streights garded by the enemye, which they could not passe without their great hazarde, and disadvantage, to diuert the enemies forces, haue presently besieged some other towne of the enemies, and there by enforced him to raise his siege, to rescue his owne Townes.

Excellency, presently besieged Deuxborough, and Zutphen Skonces, and so tooke them, and deliuered Berch from that siege.

The L. Poonings at Samerdebois in France.

K. Henry the eight, to win Bullen. Monsieur Lautrech to win Pavia in Italie. The Prince of Parma to get Sluce 1587.

This did the Earle of Leicester, 1586. in Ghelderland, to deliuer Berch, besieged by the Prince of Parma: his

and so tooke

The Prince
of Orange to
win Middle-
borough and
diuers other
strōg townes
in Zeland &
Holland.

Don Iohn de
Austria, to
get Philip-
ville.

Castuchio
for the gay-
ning of di-
uers States
in Tuscan.

The Prince
Orange for
rescue of
Townes in
Holland and
Zeland.
Counte Hol-
lock Lieute-
nant to the
Earle of Lei-
cester, to re-
lieue Graue,
Anno 1586.

A pollicie
put in execu-
tion by Han-
niball.

Some knowing a Towne so strongly scituate, and wel fortified, that by force of Battery, Scale, or Mine, they had no hope to get it, haue onely wasted and spoiled y^e Countrey round about them, cutting off all supply of Victuals from them, not suffering any of the people to issue forth, and so in time by Famine onely enforced it to yield, which otherwise, without marvellous slaughters and butcherie of men, could neuer haue bene gayned.

Some by giftes and promises haue corrupted the chiefe Captaines, or sette Dissention betweene the Souldiers and Citizens: Or mainteyned some Faction befoze begunne among them. And then by espiall ha- uing intelligence when matters were growen to ripe- nesse and perfection, geuing the one side secrete aide, vpon the sodaine haue surprisid the other Faction, and won the Towne.

Some hauing a Towne of theirs besieged with such an Armie as they were not able to leaue with any power of their owne, haue (by cutting open certaine Bankes) let in the Sea, in such aboundance, that they haue drowned al the Countrey saue onely certaine hilles & Banks, whereupon after their enemies were retired, with small flat bottomed boates for that purpose prepared, they haue victualled their friends besieged, and supplied them with men and munition: and by that meanes saued and rescu- ed the Townes, that otherwise of necessitie must shortly haue ben lost.

Some hauing layd siege to a strong Towne, vpon a Sallie made by the Citizēs, haue fained flight, abandoning their Campe, suffering their besieged enemies to take a spoile thereof. But after they had allured by that pollicie, great numbers of Souldiers and Citizens to this spoile, they haue from secrete ambushes set vpon these Citizēs, thus laden with spoiles, and pursuing the slaughter of them (euen to the walles and gates of the towne) haue en-
tered

fred pele mele with them, and by that pollicie possessed the Citie.

Some hauing a Breache made in the Curtaine of their Towne or Bulwark, haue inwardly made certaine Countertrenches and secrete Mines, laying in them Barrells of Powder, and other murdering Fireballes, and vpon the assault geuen, haue retired themselves, suffering their Enemies in great numbers to enter, mainteyning their inward Trenches, till such time as they did see Oportunitie, and then geuing fire to their secrete Mines, haue made so great a slaughter of their enemies, that following the same confusion and disorder with a couragious Sallie, they might haue leuied the siege.

Some seeing their towne no longer possible to be defended, haue in the night set fire thereon, & made a Sally out, on that part where they perceiued the siege weakest, and by that meanes haue saued a great parte of their people, not without the slaughter of many of their Enemies.

Some being by their Enemies pursued, haue left dispersed behind them Treasure here and there, and whiles their Aduersaries haue stayed to gather that Spoyle, they haue escaped. Others haue of purpose suffered their Enemies to take the spoile of their Carriages and Baggages, and being so laden and disordered with their spoiles, haue set vpon them, and defeated them.

Some being pursued by an Enemy of Force, and finding themselves no way able to deale with him in Battayle, nor seeing any other meane to saue their people, haue (contrarie to all Warlike Discipline,) caused their Souldiers to disperse themselves severall wayes without order, without Ensigne displayed, or Drumme sounded, and euery man to make the best shift he could, appointing them some other place, whether such as could escape, should make their repaire: and by this disorder, haue saued the greater part of their

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Counte Pietro Nauareso in Italy did by these meanes many notable seruices. Practised also in this last siege of Mastricht.

Mythridates pursued by Lucullus: and Tryphon K. of Syria followed by Antiochus. Also Froto K. of Demark in England.

Hanniball of Carthage environed by F. Maximus, in the mountains of Italy.

The Spaniards by the French pursued vpon their retire frō the siege of Marfilia in Prouence.

people, which otherwise had bene assured to haue perished. But this is a pollicie neuer to be put in execution but vpon great extremitie: For moze honoꝛ is it for a Generall, in common opinion by battaile maintaining Militare Orders, to be vanquished, then by disorderly flying, in this sort to saue himselfe, and some part of his people. And yet haue the most famous Generals, vpon extremitie, put it in vse, and thereby made head againe vpon the Enemy, and recouered their honoꝛ, which otherwise had vtterly bene lost.

The Duke of Alba against the Prince of Orange.

Some being inuaded by an enemy strong in Horse, haue onely fronted him in the field, determining by no meanes to giue him battel, but impaling his own faterie with Carriages, both Marching & Encamping hath maintained himselfe in such strength, that albeit his Army were farre lesse, yet was it not possible for his Aduersarie with Horsemen to enter vpon him, and thereby with time onely hath so impouerished his enemy, that finding fforage also to faile him for such a multitude of Horse, hath bene driuen without stroke striking to retire.

Scipio against Hanniball.

Some being by a forrain enemy inuaded, haue thought it the best meanes to leuie an armie, & likewise to inuade the Countrey of that Enemy. And some hauing their Countreys by Seas disioyned, after that he had by shipping transported his Armie, by necessity to make his soldiers valiant, hath burnt his own ships, shewing his soldiers, that now there was no remedie, but either by Victorie to command all, or to expect present death, or that much worse is, perpetuall Slauerie. And by this necessitie his Souldiers gathering Vertue and Courage, haue obteyned their desire.

Agathocles against the Carthaginians.

Some being inuaded by a puissant Enemy, in the day of battaile haue deferred the fight, till a good part of the day was spent, knowing that if their enemy did preuaile, yet the night comming on them, they should not so wel be able

able to pursue the Victorie, but that they being in their owne Countrey, and acquainted how all Straits & Passages, and places of strength lay for them, being protected by the darke night, might the better escape and make head againe vpon their Enimies. And contrariwise, if the Inuaders should be broken, the night comming on them, and being ignozant of the Countrey, they should haue no place of Refuge, but dispersing themselves as Fortune and Chance should leade them, could not but fall into the hands of their Enimies, who presently knewe all Straits and Passages, where to lye in readinesse to receiue them. A pollicie not vnmeet to be remembred of al such as in their Countries are inuaded.

Some expecting the inuasion of some puissant Enimie haue not leuied any Armie of force to giue them Battell, but onely certaine select Bandes of light Horse and Footmen lightly armed, and causing all the people of y Frontiers to withdraue themselves, their Cattell, Cozne, and Substance, into the strong & fortified places of the Countrey, haue with those select Bandes faced the Enimies on the Frontiers, by of keeping Straites and Passages, making sodaine attempts in the night, and such other times as by espial they found the Enimie carelesse: and so with a few people, by Time, Famine, and Expences, haue wearied the Enimies, and caused them to retyze, that happily in Battell might haue gotten the victorie, and so commanded the whole.

Some being inuaded by Sea, haue immediatly befoze the approach of the Enimie, caused their Buoyes and other Sea-markes to be changed and removed, wherby the Enimies mistaking the Channels, haue fallen with the greater part of their Flaue vpon the Shelves and Sandes: And being in that sort encombred, haue bene assailed by those their Defendant Enimies, taken, ransacked, and spoyled.

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Iugurtha in
Affrike a-
gainst the
Romanes.

Scander-
beg against
the great
Turke.

The Fla-
shingers a-
gainst the
Duke of Me-
dina his
Navy.

Hanniball a-
gainst Fa-
bius Maxi-
mus.

Some inuading the Enemies Countrey, and spoyling all the Prouince where they came, haue onely spared the houses and possessions of some one or other person among their Aduersaries, whome they did know to be of greatest Wisedome and Valour, of purpose to discredite them, and make them suspected, whereby their Counsell should not carrie Authoritie, or be followed.

Practised by
Metellus in
Affrike a-
gainst Lu-
gurth.

Some haue written Letters to some of the principall Counsellors of their Aduersaries, as it were touching some practise of Treason betweene them, and by corrupted espiall found the meanes that those Letters haue bene intercepted, and brought to the General on the other side, who for Icalousie thereon conceiued, hath not onely reiected, but also murdered those his most assured, wise, and faithfull Counsellors.

Some to bying their Enimies (that were strongly encamped) into the plaine field where they might fight with them, haue of purpose suffered some one to escape, who as a Fugitiue flying to the Enemies, hath declared that there was a Mutinie in their Camp, and immediatly of purpose the Bands haue decouided themselves, and with Ensignes Displaied, marched contrariwise, whereupon the Enemies to vse the aduantage of this Occasion haue left their strength to pursue them: And by that Pollicie turning vpon them haue defeated them.

Scipio to
King Siphax
in Aphricke.

Some sending Ambassadors to their Enemies, haue put certaine of their wisest and most expert Captaines in the habite of Seruantes and Lackies, who comming into the Camp of their Enemies vnder colour to follow some Horse of theirs that of purpose they let go, haue seene, perused, and noted many particularities, whereby they haue afterwards assayed & defeated their enemies Army.

Some haue banished some one of their most assured and trustie seruants, who confederer himselfe with the Enimie, and seeming to bewray some Secrets, hath from
time,

time to time aduertised his master of the whole estate of his aduersaries.

Some haue corrupted the Enimies Espiall, and by that meanes abusing them, haue trayned their aduersaries in to great inconuenience : A Practise aboue all other to worke great effectes, if it be discretely handled.

A Generall may somtimes inuent and spread Rumors of ayde and assistance from Forraine Princes, or such like, to Animate his owne people and terrifie his aduersarie. But such Pollicie must be vsed moze rarely, and with great Discretion.

He ought by al meanes to purchase good Espial. and not to spare any charges to be well informed frō time to time of the estate of his Aduersarie, his preparation, order, furniture, and determinations, accordingly to dispose of his owne Armie. And heereby shall a wise General, vsing Dpportunitye and occasions offered, oftentimes with small Troupes, doe wonderfull great and famous Seruices.

The Actions Militare being such as require present Resolutions, and leaue no time for Consultation, a Generall ought alwaies to be so prepared with prudent preconsideration, that no accident may happen, for the which he had not forthought his Remedie.

I might here adioyne another large Booke of Approching, Besieging and winning of Townes and Castels, by Scale, Myne, Batterie, and Famine: Also the Art to defend, & Gard Forts, and Cities, by outward and inward Fortifications, with sundry other Militare Stratagemes, and Pollicies, put in execution by prudent, valiant Captaines, wherby they haue attained miraculous Victories, and contrarie to all expectation haue escaped imminent Perils. For such Precedentes ought a wise Generall to haue readily in his memorie upon any oportunitie offered, to be readie to put the like in execution, and to be so prepared, that no such Accident or mischiese can happen, for the which he should not be provided of his Remedie,

But of this and many other, necessarie for the honorable charge of a General, I shal haue occasion to intreate in other my Militare workes of Fortification and Pyrotechnie. &c. leaving farther at this time to wade therein: Onely I haue annexed two Plats, the one of a Campe to lodge 30000 Footmen and 6000 horsemen strongly and commodiously: the other is an order of Embattelling the same Armie in plaine ground, where the Scituation yeeldeth no aduantage. And so I meane to finish this Treatise.

VIS CONSILII EXPERS, MOLE RVIT SVA.

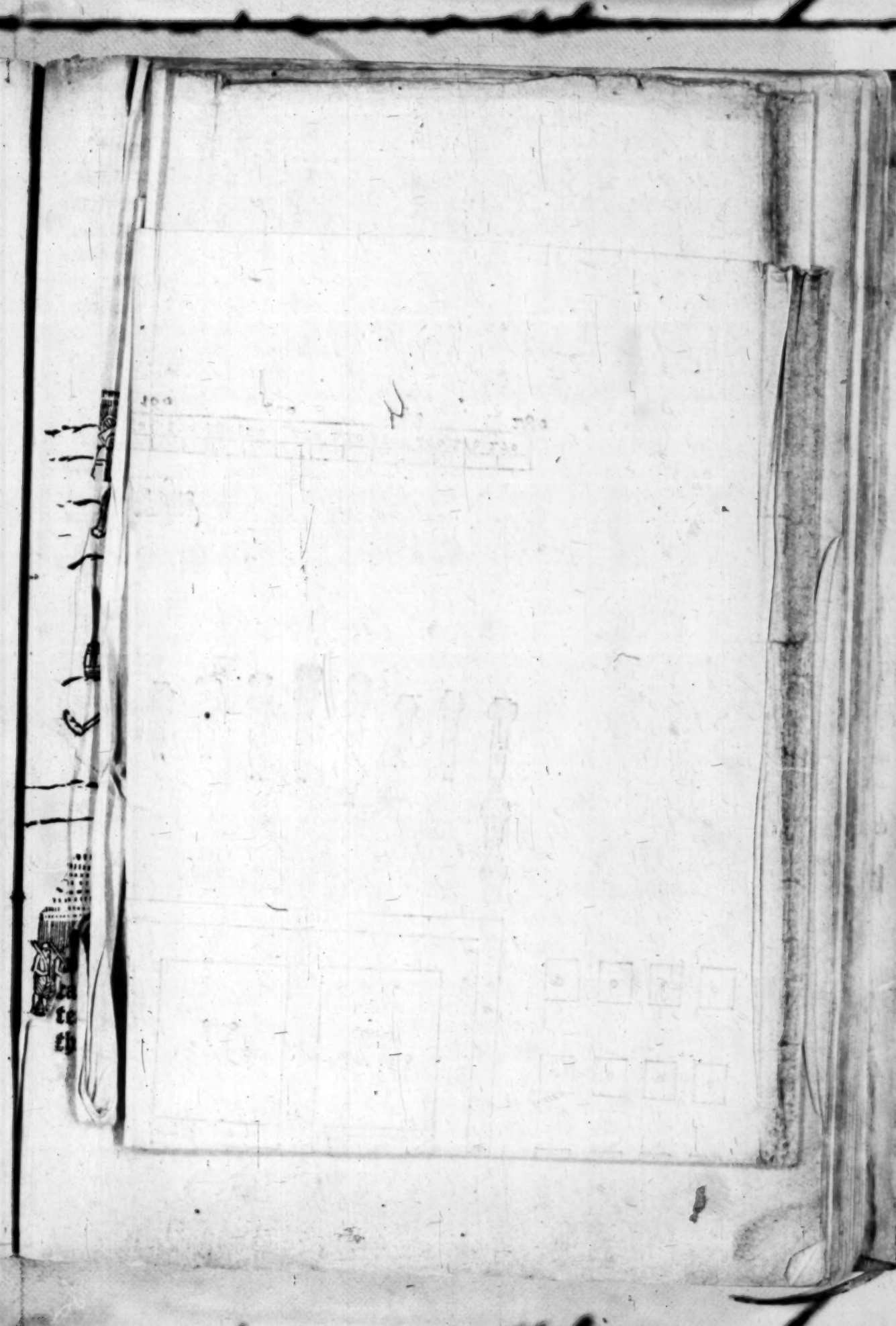
CHAP. XXIIII.

The declaration of the Campe.

For strong and commodious encamping of an Armie, the Lord High Marshall is first to finde such a place to encampe vpon, as may be conueniently woodded and wated, not subiect to any Hill within Culuering shotte, and to apply the forme of his Campe to the nature of the Scituation. But this plat I haue prescribed where al those naturall helpes fayle: And that the Generall is to trust onely to his owne order, and Artificiall strength.

When ante Armie is therfore in such place to be Encamped, ye shall first in the most commodious place, about the middest of the ground where ye meane to encampe, set vp the Generals Standard, and about the same stake out a square plat of ground 40 pace square for the Generals Pavilion. Directly from this towarde the North runneth one mayne street 40 pace broad, that deuideth the Horse Campe from the Foote Campe: And on either side of the Generals tent runneth two other crosse wayes thirtie pace in breadth, which deuide the Armed from the Vnarmed, as hereafter shall appeare.

These





These two waies inbrace two long Squares of ground fortye pace broad, and 550 pace long a peece. These may be either of them deuided into fīue lodgings of a hundred pace in length, & fortye in breadth, leauing betwene them certaine passages of ten pace in breadth, that Souldiours vppon euerie sodaine may the moze readily repaire to the place of assembly. One of these lodgings next the Generals tent may serue for the High-marshall and his retinue. And the other on the other side for the Treasuro: the rest may be assigned at the Marshalls discretion, to the other Officers of the Field, and for Ambassadors, and such Noblemen and Gentlemen as followe the warres on their owne charge, and such like.

In the Northeast quarter of the Campe are the Horsemen lodged: In the Southwest the Footemen. Either of these Campes are deuided into three partes by streetes running East and West. These streetes are 20 pace in breadth, and 580 pace long. In euerie of these three spaces of the Footecampe there are lodged a Regiment of 10000 men: and in the Horsecampe, the middlemost of them shall serue for 1500 men at Armes. The Southen space may serue for the 2500 Light Horsemen: and the other for the 2000 Demilances.

On the other side of this mayne street are the lodgings assigned for the leaders or Gouvernours of euerie Regiment and their Officers: Every pace being 30 pace broad, and 170 long. A is for the Captaine of the Demilances, B. for the Captaine of the men at Armes. And C. for the Captaine of the Light Horsemen.

Likewise D.E.F. for the leaders of the three principall Regiments of Footemen, the which ye may distinguish with the vsual names, Alward, Battaille, and Reregard, calling the Alward, that whiche lyeth next the Generals tent, and answereth to the Demilances: The Battell that whiche answereth to the men at Armes: And the

Hereward, the other against the light horsemen.

Euery of these principall Regimentes ye may againe deuise into five smaller Regimentes by streetes of tenns pace broad, running North and South, so haue ye fiftens losse Regimentes in the Foote Campe. And five a pæce in euery of the Horse Campes : And euery of these Regimentes are 100 pace broad, and 170 pace in length. And shall containe euery of them of Footemen 2000, of men at Armes 300 of Demilaunces 400 of light Horsemen 500, with their Colonels, and their Officers, &c.

The Coronels and Captaines of men at Armes, may be lodged at the head of their Regiments, as you may behold in the Campe. Those marked with G are for the Colonel of Footemen. H for the Captaine of light Horsemen, I. for the Captaines of men at Armes, and K. for the Captaynes of the Demilances. So remaine there Regiments of 100. pace broad, and 150 pace long for lodging of the Souldiours, which may, by small streets of five pace broad, be diuided into as many places, as there are several bands in euery Regiment, and then y Harbinger of euery Band must set down y Officers and Souldiours of their Bands.

These last diuisions of Bands I haue omitted, because in so small a plat it would breede but confusion, and the thing being of it selfe most plaine, it should be but tedious to rest longer therevpon.

This onely I would with the Campe Maister to obserue, that his shotte be lodged towards the outside of the Campe, hat they may be alwaies readie at the ring of the Campe vpon any Alarme. The which he may doe by deuising the vtmost seven Regiments into halfe, as you see by the pricked lines, leauing the 7 spaces marked with L. for the 7000 shotte, and the other noted with M. for 7000 Pikes, all the other Regimentes marked with N. shall be the lodgings of the 16000 short weapons.

Thus in the North moytie of your Campe, are all
your

your Armed both Hozemen and footemen lodged.

Now y other moitie must serue for the lodging of the vnarmed, as Pioners, Carters, Carpēters, Smithes, Butchers, Victualers, & all other sorts of Mechanicall Artificers, together with a large place of Assembly for the Souldiours to retire vnto, to put theselues in order vpon any Alarme, and also to exercise theselues in sundrie sorts of Activitie.

You shal therefore from the Southside of the Generals Pavilio 600 pace Southward, extend out your first maine Strete of 40 pace broad, and crosse him againe with another Strete, running East and West, 360 pace distant from the Southside of the Generals Pavilion. This Strete neede be but thirtie pace in bredth. Againe, extend out the second narrowe Strete, that runne parallel to the first maine Stret, till you come to this crosse Strete last made, so haue you O your place of Assemblie three hundred and thirtie pace broad, and siue hundred and fortie pace long, P shalbe appointed for the Punition, and Officers attendant on the Artillerie. Q. the market place. Round about this Market place may be lodged the Butchers, Bakers, Cookes, and Victuallers of all sortes.

About the Punition quarter, besides the Officers and Gunners, may the Smithes, Carpenters, Whēlewzites, and Labourers attendant on the Ordnance be placed.

About the place of Assembly, may be the Tenters of all such as furnish the Campe with thinges needefull for the Souldiers, as Armourers, Taylers, Shoemakers, and all such like Artificers.

Yet remaine there two long Squares of earth, eyther of them siue hundred and fortie pace long, & one hundred and nintie pace broad: here you may settle the Carters and Waggoners, with their Hozle and Oren: for the Carriages themselues must alwaies impale that part of the Campe that is not otherwise by Nature or Art Fortified.

In these two Quarters also may be lodged the Pioners,

and all other sortes of Labourers, that aptly cannot, or ought not be placed in or about the former Courtes or quarters of Assemblie.

Last of all, you shall describe, threescore pace distant from all those Regimentes, and their Quarters already set downe, the King of the Campe, causing some prettie Trench and Vaumure to be throwne vp, placing your Ordinance vpon the same, as in the Figure is described, and betweene the Ordinance your Carriages: and this may suffice, if the Enimie be not verie puissant, or neere at hand: but if you suspect the arriual of the Enemie, or that you know him stronger in the field then your self, and would therefore Encampe surely till farther ayde come vnto you then shall you without this King, an hundred pace distant, cause your Pioners and Souldiours (for vpon such occasion, he is not worthe to beare the name of a Souldiour, that will not set his hand to the spade) you shall cause the I say to throwe vp another Rampire, with certaine Bulwarkes at euerie cozner, and likewise in the middle of the Curtaine, that Musket shotte may play betweene them: or if time would permit. it were convenient euery twelue score to haue of these Circulare Platteformes, with a Vaumure, to defend the small: shot for in so short time it is impossible to make anie sufficient Rampire to abide a Batterie: neither can a Campe be furnished of victuals to abide anie long time. And that is the cause why I haue described these plaine Circulare formes, which in Fortification of a Towne or Foote were meere ridiculous, and in a Campe to make them more exquisite, were no lesse foolish Curious.

How this Campe should be Watched and Warded, I haue declared in the office of the Scoutemayster, but what kindes of Engins may be prepared for defence, I reserue for my Treatise of Fortification and Pyrotechnie, admo- nishing in the meane time all such Noble and free minds,

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English En-
camping,
noted by
Guicciar-
dine in his
Italian Hi-
storie.

as take delight in the Sciences Liberall, and couet knowledge in this Arte of great Artillerie, or Fortification of Townes, Fortes, or Camps, against the furie of this new Engine, &c. to acquaint themselves with so much of the Science of Numbers, both Vulgare and Cosical, as I haue in this Treatise taught, and also with so much of the Science of Geometry, as concerneth measuring of Lengths, Heights and Distances, the making of Mappes, and Plans in true measure and Proportion, and the Supputation of the contents Superficiall, as you may reade at large sette downe in my other Treatise Geometricall, named Pantometria, so shall they be prepared for my other woorkes, and for attayning such perfection in the Arte of Souldiorie, for all kindes of seruices Offensiuē or Defensiuē by Land or Sea, in manner howsoever. As without these knowledges cannot be so much as aymed at, and much lesse effectually atchieued.

Labore & Vigilantia.

A Declaration of the Battell in portraiture.

These Souldiers thus orderly lodged in their severall Regiments every one distant from other, may most easily and readily, after the usuall manner, be ranged into three severall battailes, armed with Pikes, and flanked with Shot. But because I haue already in my Arithmeticall questions vpon the Sergeant Maiors office, declared how these kindes of Embattailing, and also the Mayne Square, armed round with Pikes, may be readily framed, I haue thought good here to set downe a forme of Battaile more seruiceable and forcible than those common sorts.

And although these 30000. Footmen, and 6000. Horsmen, may by the ingenious Sergeant General, according to the nature of the Place, be sorted and diuided into an infinite number of other seruiceable formes of Battaile: Yet I

thought good to set down one of that sort, where no advantage is gained by the nature of the place, but that the Generall is onely to trust to the strength of his good order.

And albeit I would wish such perfection in our Souldiorie, as was in the Romane, that they might be able to fight, and retire in order, & so make many sundry Heads upon the Enemy, if Fortune did abandon them in the first or second encounter: Yet considering how our Souldiorie in these dayes are trained, I thinke it utterly vain to praise the Romane order, albeit of all other it were with perfect Souldiers the most invincible.

But to use still our common byrte maine Battaille, or thre Battailles in one Front, committing the whole field to one byrnt of Service, as now a daies is used, I holde it Barbarous, and haue therfore in this forme of Battail that I wil now set down, sought a meane course, not so exquisite but that the Souldiers of our time might be able to learne, and put in execution.

I haue first therfore diuided the Army into 2. Frontes, or Faces: The first (as ye may behold) I haue seperated into 8. Battalions, euery of them hauing 30. in a ranke, & 33. rankes. They are armed in the front with 7. rankes of Pikes, all the rest thort weapon, as, Swords & Targets, Halberts, Billes, or such like. Euery Battalion conteyneth 1000. men lacking 10. and are placed thre or four paces one from another.

The second Front is diuided into 5. greater Battalions, euery one of them being of 2000. men, 40. in a ranke, and 50. Rankes, euery Battalion armed in the Front with 6. rankes of Pikes. These Battalions are one from another at least 25. pases, and the one Front of Battailles from the other at least 60. paces. In or nigh the middle Battalion of this second Front shalbe the General himself when he seeth time.

These Battalions are impaled on either side with an
bun

hundred ranks of Pikes, 7. in a ranke, and on the Backe with six rankes of pikes. Without these haue I placed my shotte, marked with this signe \odot in 24. troupes, euery troupe conteyning an 100. There is also in the Forelorne hope befoze the face of the Battaille, likewise 18. Troupes of shot of an 100. a peece, their orders ye may note by this figure \odot : But after they come to face the Enemie, they must Disband, and mainteine skirmish, as hertofore moze particularly hath bene declared.

Last of all are the Wings of Horsmen on either side diuided into 3. Troupes. The 2. first are the men at Armes, 30. in a ranke, and 25. rankes. The 2. second are Demilances, 30. in a ranke, and 33. Rankes. The last are the Light-horsmen, 50. in a Ranke, and 25. Rankes.

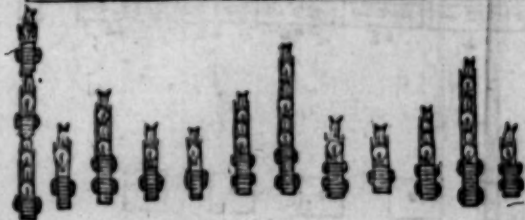
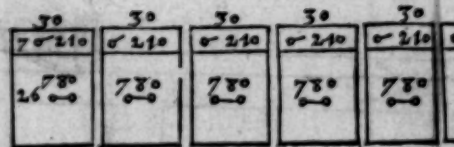
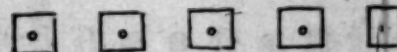
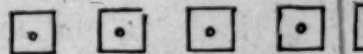
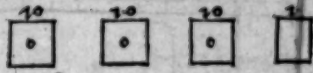
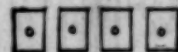
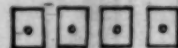
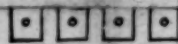
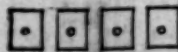
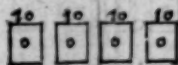
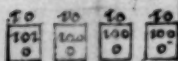
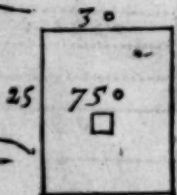
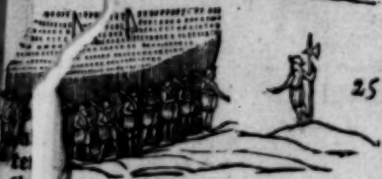
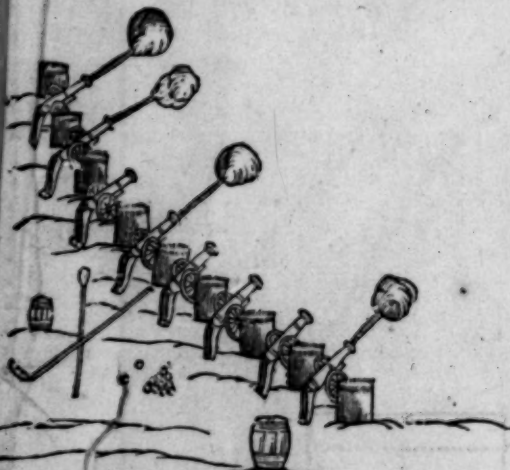
Thus haue ye in the first Front of Pikes, 1680. In the second Front 1200. In the Empalement 3800. These in all amount to 6680. So is there left 320. Pikes to be employed in loose files to accompanie such shot, and short Weapon, as shal remain for the gard of the Ordinance.

Likewise in the first Front there are of short Weapons 6240. In the second Front 8800. So doe remaine 960. short Weapons to be employed together with the remnant of the Pikes for garde of the Artillerie or Carriages, or els to mingle with the Shot in the Forelorne hope, the which when they shall grow pele mele with the Enemie, will be able to doe great seruice.

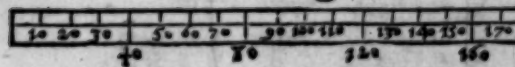
Also after the battailes approach, they may retire with the Forlorne hope, to assist their Horsmen.

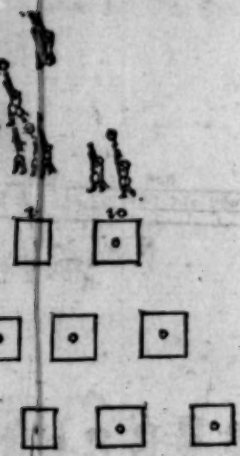
The shot ye may behold sorted in Troupes 1800 in the Front, and in either Wing 2400, so do there remaine 400 Shot moze to ioyne with the Pikes and short Weapons extraordinary in any of the foresaid seruices.

Thus after the great Ordinance on either side haue discharged, the Forelorne hope is continually to be supplied with newe Troupes of shot from the Flankes



5e Scale of Pages





3°	3°	3°	3°
210	210	210	210
78°	78°	78°	78°

4°	4°
240	240
176°	176°



of Pages

50	170	180	190	210	220	230	250	260	270
160	200	240	280						

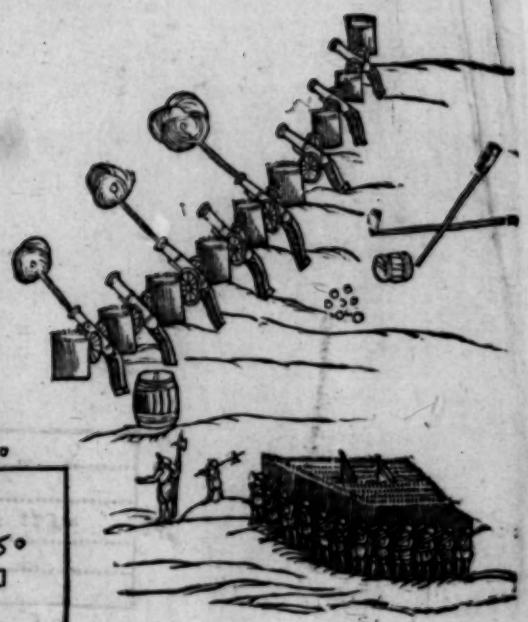
10	10	10	10
100	100	100	100
1°	1°	1°	1°
0	0	0	0
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0	0	0	0
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3°
75°
□

3°
99°
△

5°
* 125°

25





These two waies embrace two long Squares of ground fortye pace broad, and 550 pace long a peece. These may be either of them deuided into five lodgingses of a hundred pace in length, & fortye in breadth, leauing betwene them certaine passages of ten pace in breadth, that Souldiours bypon euerie sodaine may the moze readily repaire to the place of assembly. One of these lodgingses next the Generals tent may serue for the High-marshall and his retinue. And the other on the other side for the Treasuroz: the rest may be assigned at the Marshals discretion, to the other Officers of the Field, and for Ambassadors, and such Noblemen and Gentlemen as followe the warres on their owne charge, and such like.

In the North-east quarter of the Campe are the Horsemen lodged: In the North-west the Footemen. Either of these Campes are deuided into three partes by Streetes running East and West. These Streetes are 20 pace in breadth, and 580 pace long. In euerie of these three spaces of the Footecampe there are lodged a Regiment of 10000 men: and in the Horsecampe, the middlemost of them shall serue for 1500 men at Armes. The North-east space may serue for the 2500 Light Horsemen: and the other for the 2000 Demilances.

On the other side of this mayne street are the lodgings assigned for the leaders or Gouvernours of euerie Regiment and their Officers: Euery pace being 30 pace broad, and 170 long. A is for the Captaine of the Demilances, B. for the Captaine of the men at Armes. And C. for the Captaine of the Light Horsemen.

Likewise D.E.F. for the leaders of the three principall Regimentses of Footemen. the which ye may distinguish with the vsual names, Vaward, Battaille, and Reregard, calling the Vaward, that whiche lyeth next the Generals tent, and answereth to the Demilances: The Battell that whiche aunswereth to the men at Armes: And the

Hereward, the other against the light horsemen.

Euery of these principall Regimentes ye may againe deuide into five smaller Regimentes by strectes of tenna pace broad, running North and South, so haue ye fiftene lesse Regimentes in the Foote Campe. And five a pece in euery of the Horse Campes : And euery of these Regimentes are 100 pace broad, and 170 pace in length. And shall containe euery of them of Footemen 2000, of men at Armes 300 of Demilaunces 400 of light Horsemen 500, with their Coronels, and their Officers, &c.

The Coronels and Captaines of men at Armes, may be lodged at the head of their Regiments, as you may behold in the Campe. Those marked with G are for the Coronel of Footemen. H for the Captaine of light Horsemen, I. for the Captaines of men at Armes, and K. for the Captaynes of the Demilances. So remaine there Regiments of 100. pace broad, and 150 pace long for lodging of the Souldiours, which may, by small straits of five pace broad, be diuided into as many places, as there are several bands in euery Regiment, and then y Harbinger of euery Band must set down y Officers and Souldiours of their Bands.

These last diuisions of Bands I haue omitted, because in so small a plat it would breede but confusion, and the thing being of it selfe most plaine, it should be but tedious to rest longer therevpon.

This onely I would wish the Campe Maister to obserue, that his shotte be lodged towards the outside of the Campe, hat they may be alwaies readie at the ring of the Campe vpon any Alarme. The which he may doe by deuising the vtmost seven Regiments into halfe, as you see by the pricked lines, leauing the 7 spaces marked with L. for the 7000 shotte, and the other noted with M. for 7000 Pikes, all the other Regimentes marked with N. shall be the lodgings of the 16000 short weapons.

Thus in the North moytie of your Campe, are all
your

your Armed both Horsemen and footemen lodged.

Now y other moytie must serue for the lodging of the vnarmed, as Pioners, Carters, Carpenters, Smithes, Butchers, Victualers, & all other sorts of Mechanicall Artificers, together with a large place of Assembly for the Souldiours to retire vnto, to put theselues in order vpon any Alarme, and also to exercise theselues in sundrie sorts of Activitie.

You shal therefore from the Southside of the Generals Pavilio 600 pace Southward, extend out your first maine Streete of 40 pace broad, and crosse him againe with another Streete, running East and West, 360 pace distant from the Southside of the Generals Pavilion. This Streete neede be but thirtie pace in breadth. Againe, extend out the second narrowe Streetes, that runne parallel to the first maine Street, till you come to this crosse Streete last made, so haue you O your place of Assemblie three hundred and thirtie pace broad, and five hundred and fortie pace long, P shalbe appointed for the Munition, and Officers attendant on the Artillerie. Q. the market place. Round about this Market place may be lodged the Butchers, Bakers, Cookes, and Victuallers of all sortes.

About the Munition quarter, besides the Officers and Gunners, may the Smithes, Carpenters, Wheelewrightes, and Labourers attendant on the Ordnance be placed.

About the place of Assembly, may be the Tenters of all such as furnish the Campe with thinges needefull for the Souldiers, as Armourers, Taylers, Shomakers, and all such like Artificers.

Yet remaine there two long Squares of earth, eyther of them five hundred and fortie pace long, & one hundred and nintie pace broad: here you may settle the Carters and Waggoners, with their Horse and Dren: for the Carriages themselves must alwaies impale that part of the Campe that is not otherwise by Nature or Art Fortified.

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The second Front is diuided into 5. greater Battalions, euery one of them being of 2000. men, 40. in a ranke, and 50. Rankes, euery Battalion armed in the Front with 6. rankes of Pikes. These Battalions are one from another at least 25. paces, and the one Front of Battailles from the other at least 60. paces. In or nigh the middle Battalion of this second Front shalbe the General himself when he seeth time.

These Battalions are impaled on either side with an
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The shot ye may behold sorted in Troupes 1800 in the Front, and in either Wing 2400, so do there remaine 400 Shot moze to ioyne with the Pikes and short Weapons extraordinary in any of the foresaid seruices.

Thus after the great Ordinance on either side haue discharged, the Forelorne hope is continually to be supplied with newe Troupes of Shot from the Flankes

and Wings, & these troupes of the foreloz hope, that haue discharged, should retire betwæen the Battail and þ troupes of Horse, to the back of the Wings, so mainteyning the Flankes alwaies furnished. And thus may they (being wel led) maintein Skirmish continually with fresh men, and the Battaile alwaies impaled.

But after the Battailles begin to approach, the Forelorne hope must withdrau themselves: Then is your first Battail strongly fronted and impaled with Pikes, to abide any charge of Horsemen, and after their Pikes be broke, are together with þ rest of the short weapon to deale with the enemy, and during the continuance of the fight, betwæne these Battalions the Shorter may continually discharge in the face of the enemy.

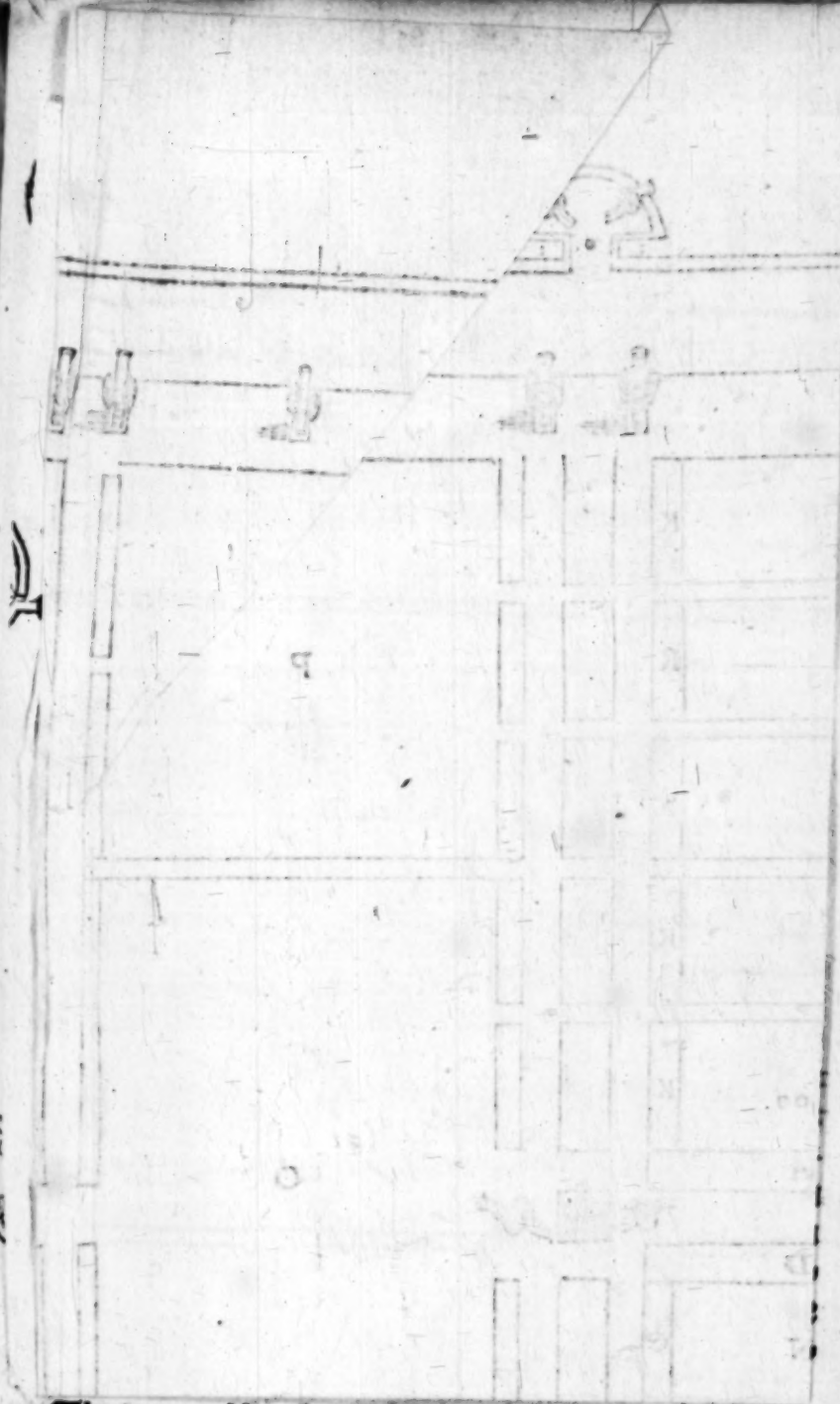
Likewise there may be made certaine small Carriages, some laden with Muskets, some with Calabashes, others with murthering Fireballes: and these Carriages may (during the Battaile) continually spoyle the Enemies Front, being safely garded betwæen the Battalions.

The fashion of these Carriages, and many other serviceable Engins, not yet practised, I reserue to my Treatise of Pyrotechnie and Fortification.

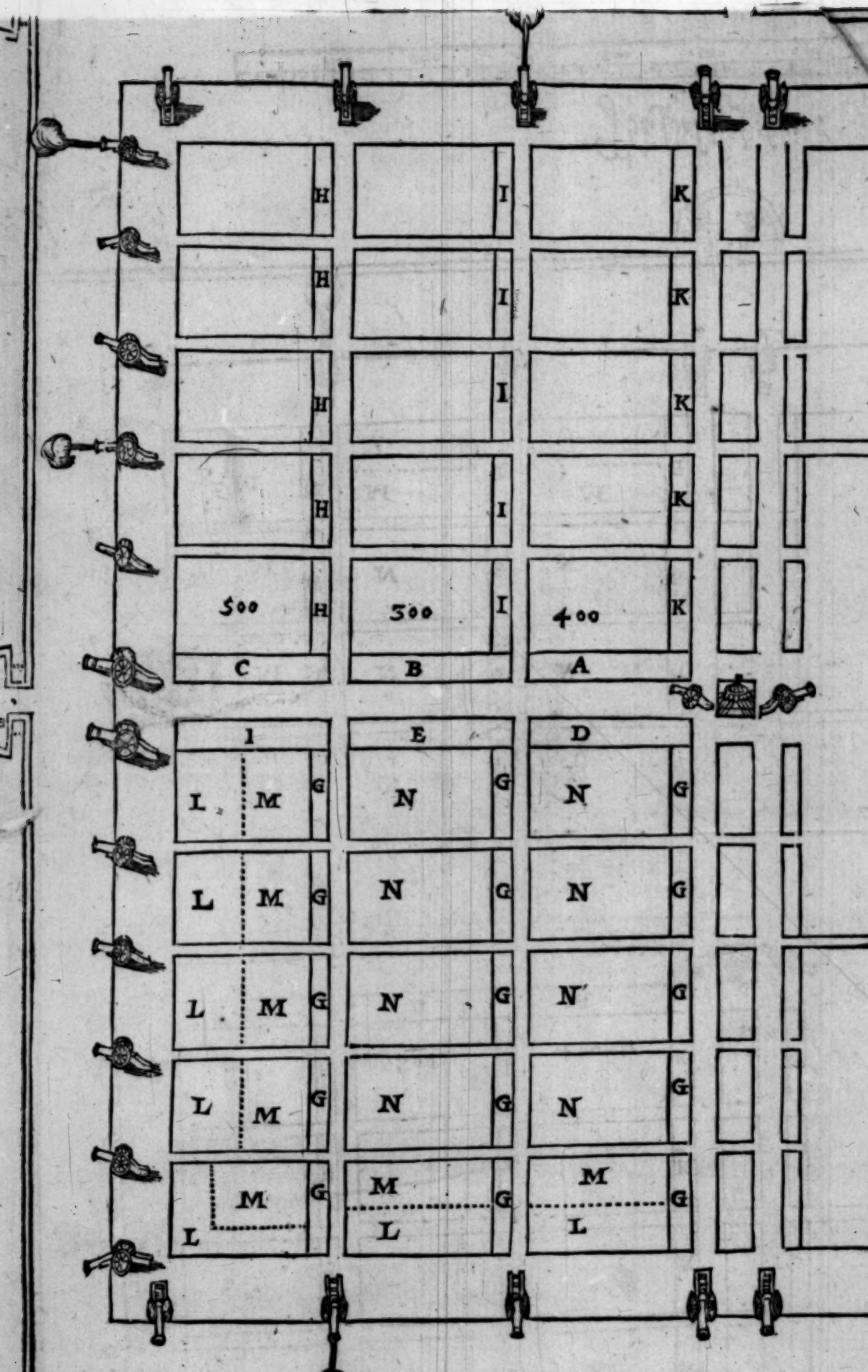
But if Fortune should abandon thẽ in the first encounter, and that they be broken by the Enemies, yet haue they those ample spaces betwæne the Battalions of the second Front to retire vnto, there to make Head, and geue the enemy battaile againe.

And these Spaces or Lanes betwæne the Battalions, serue not only to receiue the Skirmishers, or other þ shall retire, but also for the Messengers, which among the Romanes were called Mandatores, to passe to and fro, and to signifie to all parts frõ time to time þ Generals pleasure.

Of the Horsemen, the men at Armes are first placed, who are first on the Flanke of the Enemy, to geue the charge when time is. The Demilaunces are to followe them



There are also other causes and circumstances which
 may likewise worke some alteration: as the Raritie of
 the Air



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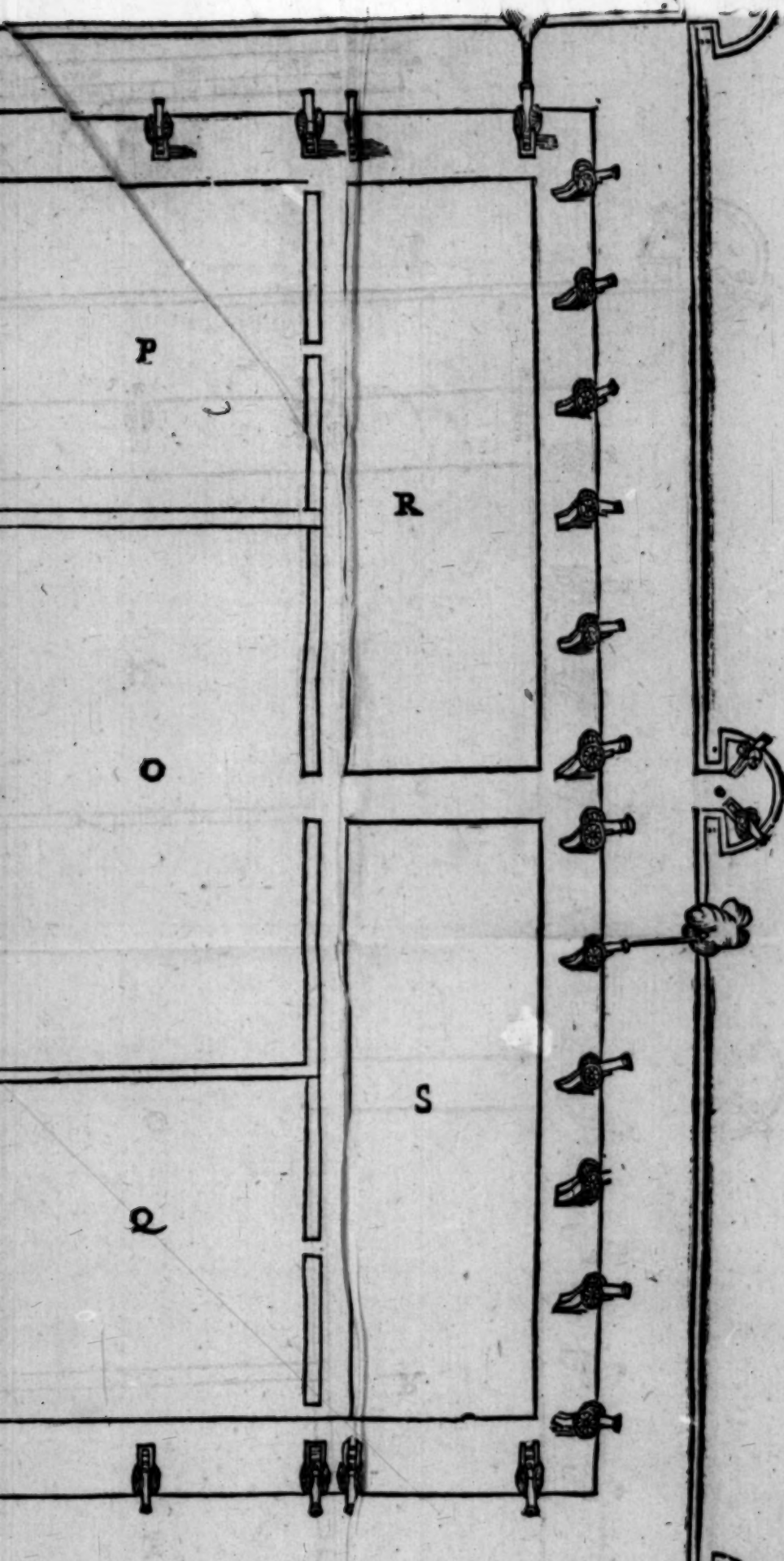
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who are first on the Flanke of the Enemie, to geue the
 charge when time is . The Demilaunces are to followe
 them

them, if they haue Victorie, or to assist them, if they be repulsed, or charged by the Enemy: And the Bandes of Light Horsemen to gene ayde to them both, and also to follow the chase when the Footemen are broken.

What scope of ground this whole Battaile, and particularly, euery of his Battallions, Troupes, Empalements, &c. requireth, the Scale discouereth: And superfluous were it to vse mo wordes in this matter.

These Characters	$\left\{ \begin{array}{c} \odot \\ \oslash \\ \otimes \\ \triangle \\ * \end{array} \right\}$	Signifie	$\left\{ \begin{array}{l} \text{Shot.} \\ \text{Pikes.} \\ \text{Short weapon.} \\ \text{Men at Armes.} \\ \text{Demilaunces.} \\ \text{Light Horsemen.} \end{array} \right\}$

FABER EST QVISQVE FORTVNAE SVAE.

CHAP. XXV.

Certaine Questions in the Arte of
Artillerie, by Mathematicall Science ioyned
with Experience, to be debated
and discussed.

The diuersitie of the force and violence of great Artillerie, and of the farre or nigh shooting and variable range of their Bullets, both chiefly arise and grow of these foure principall causes: Powder, Peece, Bullet, and Randon. In Powder is considered Quantitie and Qualitie. In the Peece the length and proportion of the Cylinder. In the Bullet his waight and Quantitie. In Randon the degrees of Altitude from the Horizon or plaine where the Peece must play. These may be called the Prime, substantiall or effectuall causes.

There are also other causes and circumstances which may likewise worke some alteration: as the Raritie or

Densitie of the ayre. The Winde. The diuers wadding & ramming in charging. The inequality of the ground or Plat-forme, and wheeles of the Carriage reculing. The regular or irregular Boring. The distempering of the Peece hot or cold, and well or ill fitting the Bullet. These may be termed secundarie or Accidentall causes of alteration, which by Practise and vse will best be learned, and their Errours by discretiō reformed, albeit for some of them certaine Rules may also be prescribed.

But these Questions ensuing, are onely of such Alterations as grow by those first soure principall or substantiall causes, supposing all these other accidentall by good discretion well ordered and vniformely guided. And first of Powder.

Of Powder.

Whether there be not for any Peece proponed, such a certaine Quantitie of Powder to be founde, as duely to the charge of the same Peece agræth, and that in such sort that charging the Peece with more or lesse than that Quantitie, it shall hinder the farre ranging of the Bullet.

There is
such a
charge cer-
taine.

No.
The second
shall ouer-
shot the first

2 Whether one and the selfe same Peece twice charged with one and the selfe same Quantitie of Powder and Bullet, discharged also at the same Randon, shall make the same Ranges, hauing all one maner of Charging, Wadding and Ramming.

No.

3 If a Peece be discharged with the waight of his Bullet in Serpentine Powder, and afterwards againe discharged with y halfe waight of his Bullet in such Corne Powder as shall cause y Peece to cast the same ground, I demaund if the same Peece be againe charged with halfe the quantitie of either sort, whether these second Ranges shall also be equall: the forme of charging being vniforme, and temper of the Peece all a like.

4 If two Peeces of the same Length and Bullet be charged with one kinde of Powder, but severall Waights, I demaunde whether the Ranges shalbe proportionall to the said waights, or to the $\sqrt[3]{}$ or $\sqrt[4]{}$ Rootes of the said waights, or whether the proportiō of those Ranges be not to be found without any further respect either to the Length of the Peece or Wonderositie of the Bullet, considering by Hypothesis all those are equall.

No.

5 Whether the Proportion found in one kind of Powder, hold not in all other kindes, of what mixture soever it be, the Peeces and Bullets being as is before supposed, equall.

No.

6 One Peece being charged first with one quarter of the waight of the Bullet, after with one halfe, finally with the whole waight and the Ranges of the Bullet at Point Blanke noted, I demaunde Whether the same Ranges be not Proportionall, all circumstances of charging, &c. being unifoꝛme.

No.

7 Whether the Proportion of such Ranges be not a meane Proportionall resulting of the commixtion of the Equalitie of the Peeces Lengths and Bullets, and of the Inequalitytie of the Pouders Quantitie, the Qualitie being supposed like.

Referred to
my Treatise
of great Ar-
tillerie.

Of the length of the Peece and Powder.

Whether two Peeces being in all respects equall, saving onely in Length, being charged with one Bullet, and one Quantitie of Powder, shall not make severall Grazes.

Yes.

2 Whether y^e longer Canon shall make the greater Range, whatsoever Quantitie or kinde of Powder they be discharged withall, the Quantitie of Powder being equall.

Not alwayes

3 Whether there be not a certaine convenient Length of the Peece in respect of his Bore or Bullet, to make the best most Range, in such sort that the making of the Canon longer shall rather hinder than further.

Yes but not
without re-
gard of the
Pouder.

4 Whether this Length and Proportion being founde

¶ In y

No.

in one Peece hold in all other (the proportion I meane) for the length must of necessitie alter.

The Proportions will be different.

5 The Proportion being by Experience found with Serpentine Powder according to the ordinarie charge, whether giuing like quantitie of Corne Powder, the same proportion of perfection shall hold, or a new be to be sought in respect of the alteration of the Powder.

No.

6 If two Peeces being in all respects equall saue onely in Length, being discharged with one Bullet & Quantitie of one sort of Powder make severall Ranges at Point blak discharged: I demaund whether the same proportion of ranges shall still continue with whatsoener Quantitie or kinde of Powder the same Peeces be charged: the Quantitie being alway equall and all other circumstances of charging and discharging in either of them like.

7 If two Peeces in all respects like saue onely in Length be charged with one Bullet, & the waight of the same Bullet in ordinary Serpentine Powder, I demaund whether their Ranges shall beare the proportion of the length of their Canons, or of the Vacant hollow Canons from the Charge to the Mouth. Or if it beare not the same proportion, whether they carry not the proportion, of the $\frac{1}{4}$ or $\frac{3}{8}$ Notes, considering all other circumstances being Equall saue onely the Longitude of the Canons, it is apparat that from their proportion as the originall cause, the proportion of the Ranges must in this case be deriued.

No.

8 If there be 3 Peeces in all respects equall saue onely in length of their Canons or Cylinders & yet those 3 Longitudes proportionall, I demaund whether the Ranges of their Bullets shall not be proportionall, all other circumstances saue onely this of Lengthes, being one, equall and like.

9 If there be 3 Peeces, as afoze, hauing the Longitude of their hollow or vacant Cylinders proportionall, whether then all the rest being equall and vniforme, the Ranges shall not be proportionall.

10 Q^d if in one of these cases the proportion of \hat{y} Ranges be not a meane proportional resulting of the commixtion of the equalitie of the Bullets weights, the Equality of the Pouder, and the Inequality of the longitude of the Cylinders either whole or vacant.

Of the Powder and length of the Peece
considered with the Bullet.

If a Peece twice discharged with one quantitie of \hat{y} same Powder, but the Bullets in waight different, I demand whether the lighter shal alway out-fly the heavier, or that some conuenient waight may be found.

Note always
there is a
meane con-
uenient.

2 Whether this conuenient waight of the Bullet alter not according to the quantitie or validitie of the Powder.

Yes.

3 Whether to finde the said conuenient Ponderositie of the Bullet it be sufficient to consider the Powder or that the Longitude of the Peece also cause therein a diuersitie.

Both.

4 If a Peece be twice charged, first with an Iron, then with a Led shot, the quantities of Powder at both times equall: whether the difference of the ranges be not deriued onely from the proportion of the waights of these bullets, all other circumstances by Hypothesis differing not. And what relation to the Ponderositie of the Bullets these Ranges haue.

5 Two Peeces being in all respects equall, and charged with one kind of Powder, but different Bullets, the one Iron, the other Lead, and either hauing the waight of his Bullet, I demanda whether the Ranges be equall.

6 If one Peece be charged thræ severall times, first with a stone Bullet, then with Iron, finally with Lead, and the Iron of such temper that it be an exact meane proportional in waight betwene \hat{y} other two, being all discharged with one quantitie of Powder, I demande whether the Ran-

No.

ges shall be in continuall proportion.

No. 7 If a Peece be twice charged, first with Iron, then with Lead, hauing one quantity of Powder, and the Ranges noted: I demand whether being charged with any other quantitie of Powder, the Ranges of the same Bullets shall not alwaye retaine the same proportion.

No. 8 The Proportion found by experience in one Peece of the different Ranges that Iron and Lead Bullets make, whether the same proportion hold in any other Peece longer or shorter, shooting the same Bullets whatsoeuer her length be.

9 If in a Faulcon for example, by experience I finde two such quantities of Powder, as discharging the Falcon with the first quantitie of Powder with an Iron shot: and again discharging her with the second quantitie and a Lead shot, they range both duely one ground: I demand whether in a Saker of the same length with the Falcon, charging her first with an Iron Bullet, then with a Lead Bullet, vsing the same quantities of Powder, whether their Ranges shall be proportional. And whether doubling either quantitie of Powder, it shall alter the proportion of the Ranges.

No. 10 If two Peeces of one length be of such different Quantitie of Bullet that the one being discharged with a Lead Bullet, the other with an Iron Bullet, either hauing of Powder the waight of their Bullet, & so make equal Ranges: I demand whether either of them discharged with half the waight of their Bullets in Powder shall Range alike also.

Not alwayes 11 If two Peeces be of one length, but of seuerall quantitie of Bullet, and yet of one kind of Metall or substance, and discharged with the waight of the Bullet in one kinde of Powder, I demand whether they shall not range one ground being equally mounted.

12 If there be once found by experience in some one Peece such a perfection of a Canon, as whether ye make him longer or shorter he shall shote lesse ground hauing alwaye the waight of his Bullet of one kind of Powder to his charge,

I

I demand whether if another Peece whose Cannon or hollow Cylinder is in proportion like to the same, though greater in quantitie, shall not be of the like perfection.

13 If two Peeces hauing their hollow Cylinders Similes or proportionall, be discharged with the waight of their bullets in Powder at like Randon, I demand the proportion of the Ranges, & quantity of their Cylinders knowne.

14 Of any two Peeces presented, to know which shall shoot farthest being both charged with the waight of their Bullet in Powder, the force of the Powder being first in some one approued.

15 Any two Peeces being proponed, how to charge them with such quantities of Powder as they may both at like Randons Range like ground.

16 Hauing proued any Peece at his utmost Randon with any one kinde of Powder, to know how to diminish the proportion of the Powder from time to time in such proportion as the Peece keeping that Randon shall shoot any part you will assigne of the first Shot.

Of Randons.

Seeing it is by experience found, that euery Peece of Ordnance being at the *Leuell* or *Point Blanke* discharged, throweth forth his *Bullet* with such *Violence* that it passeth a good distance directly without any sensible *Inclination* or touching of the ground, the first *Graze* that it maketh I terme the *Leuell Range*: and the same may also be called the right line of the *Leuell Range*, the Peece being on *Leuell ground*, and not mounted on a *Plat-forme*. In like sort if a Peece mounted at any *Randon* be discharged, the *Bullet* first violently issueth out a good distance directly without making any sensible declination from the right line, by the *Axe* of the Peece determined, and that *Distance* may be termed the right line of the *Randon Angle*: hereof ariseth a question.

Not equall
but propor-
tionall.

Yes.

No.

Yes.

Yes
in a calme
day.

No.

No.

No.

No.

Nearer but
not perſe
conical, but
rather heli-
call.

1 Whether the right line of the vtmoſt Randon be equal to the right line of the Leuel Range, or whether in all Peeces they retaine one Proportion.

2 Whether the right line of the vtmoſt range be not leſſe than the right line of 90 grades of Randon.

3 Whether the right line of vtmoſt Range be a Meane proportional betwene the right line of the Leuel, and the right line of the Verticall Range, viz. mounted 90 grades.

4 Whether the right line of the vtmoſt Randon be not rather a Meane Proportionall betwene the right line of the Leuel Range and that Grade of Randon that rangeth the ground of the Leuell Range.

5 Whether the right lines made by any two Peeces at one Randon diſcharged, be not Proportional to the Ranges of their Bullets at the ſame Randon.

6 Whether the right lines made by any two Peeces at any Randon, be not Proportionall with their vtmoſt Ranges.

7 Whether the vtmoſt Randon, I meane to make the vtmoſt Range, be alwayes one, whether the ground be Leuel or ascending.

8 Whether the Bullet end his Range with a line not ſenſibly different from a ſtraight line, as it doth begin his circuite.

9 Whether all Peeces at one Randon diſcharged, as they make one Angle at the beginning of their courſe, do alſo make one Angle at the end of their race.

10 Whether the Angle at the end of the Circuite made with the Bullet be equall with the Angle of Randon.

11 Whether the vpper part of the Circuite made with the Bullet, be a poztion of a Circle, as Tartalea ſuppoſeth.

12 Whether it be not rather a Conical Section and different at euery ſeuerall Randon.

13 Whether it be not at the vtmoſt Randon a Section Parabolicall in all kind of Peeces, and to differ in greatneſſe

nesse according to the greatnesse of the Cone that to euery seuerall Cylinder or Peece of Ordinance is conuenient, being Proportionally charged according to the perfection heretofore mentioned.

14 Whether at al inferior Randons that Arke by Tartalea Imagined Circular, be not an Eleipsis, and the same altering according to the capacity of the Cone to the Peece appropriate, and also according to the difference of the Angle of Randon.

15 If the quantitie of the Cone to euery Peece proportionally charged, be by experience found, I demand whether then this Eleipsis shall not make an Angle with the Parabola Section equall to the distaunce betwene the grade of Randon proposed, and the grade of the uttermost Randon.

16 Whether in all Randons aboue the uttermost, the said Curue Arke, be not an Hyperbole.

17 Whether the same Hyperbole do not also alter at euery seuerall Randon, aboue the said utmost Randon.

18 Whether the Hyperbole that delinereth this Curue Arke, be not such a Section as maketh with the Axis of the Cone, an angle equall to the Angle of the Randons Complement.

19 Whether in euery of the Elipseicall and Parabolicall Sections there be not a continual alteration of the Angle of the Cone also in respect of the new Angle of Randon.

20 Whether the Parabolicall Section be not made at 45 Grades of Randon, rather than at the Grade of the utmost Randon, and so the Hyperbole at al Randons aboue, and the Eleipsis at all inferior Randons in manner before expressed.

Albeit all these random Arkes be helical and not perfit conical, yet haue they a verie neere resemblance.

These may suffice to giue some tast how large a Sea of Inuentions & ingenious Mathematician hath to wade in, & will aspire to the perfection of the Art of handling great

Artilerie, & also how farre off such Cannoniers are from the first Elements of that Science, that being able to make some faire shot from their ordinarie Plat formes, to their vsuall beaten Parks, do think theselues therfoze perfit Masters. But as it is vtterly impossible for Archimedes himself (if he were living) without Experience, long Practise, & sundry trials, to demonstrate the manifold varieties of that mixt Helical Arke or circuite of the Bullet, composed of violent, and natural motions, receiuing infinite diuersity, according to the seuerall proportion of their Temperature: So is it far more impossible and absurd to imagine, that any ignorant of those Sciences, should euer be able to approach the Gates of that Art, hitherto by no Nation to any purpose handled. For to passe ouer the apparant Errors of Daniel Santbech & German in his booke *de Artificio Etaculandi Sphas Tormentarias*: the false Rules of Girolamo Ruchelly, & grosse errors of many others, & being ignorant of & Mathematical, haue taken vpon them to write of this Art: Euen Tartalea the Italian, albeit he were an excellent Geometer, taking vpon him to deliuer sundrie Demonstrations in this new Science, yet for want of Practise, and Experience, hath erred euen in the first Principles, and so consequently in the whole substance of his discourse. This Tartalea auerreth the Angle of 45 grades, as meane betwene the Horizontal & Vertical mounts or Eleuations, to be the Angle of the vtmost Randons: an Error knowne euen to the first Practitioners. He affirmeth also the declining Arke of & Bullet to be a Section Circular: an Error likewise, but not so easie to be discerned. And whereas great Fame hath bene spread of certain Tables by him invented, to declare the differēt Ranges of Bullets from all sorts of Peeces deliuered at all Grades of Randon (a matter in deed rare, & of great inuention) thus much I dare truly auow and approue, that Tartalea vpon those his fallible grounds & Erronious principles, was neuer possibly able in those

those matters to deliuer any certainty. The same among other was in deed by my father lōg practised, who ioyning continual experience for many yeares with Geometricall Demonstrations, sought, & at last found, & did frame an Instrument, with certaine Scales of Randons to performe all that Tartalea by his Tables promised: As also by Reflection of Glasses to fire Powder, & discharge Ordnance many miles distant. And such was his Felicitie and happie successe, not only in these Conclusions, but also in y Optikes and Catoptikes, that he was able by Perspective Glasses duely situate vpon conuenient Angles, in such sort to discover euery particularitie of the Country round about, wheresoeuer the Sunne beames might pearse: as sithence Archimedes, (Bakon of Oxford onely excepted) I haue not read of any in Action ener able by means natural to performe the like. Which partly grew by the aid he had by one old witten booke of the same Bakons Experiments, that by strange aduenture, or rather Destinie, came to his hands, though chiefly by coniugning continuall laborious Practice with his Mathematicall Studies.

The which vpon this occasion I thought not amisse to rehearse, as wel for the knowne Veritie of the matter (diuers being yet alieue that can of their owne sight & knowledge beare faithfull witnesse, these Conclusions being for pleasure commonly by him with his friends practised) as also to animate such Mathematicians as enioy that quiet and rest my froward Constellations haue hitherto denyed me, to imploy their studies & trauels for Inuention of these rare seruiceable Secrets. But such is my hard Destinie, that as Gods pleasure was to take my Father from me in my yong and tender yeares, and euen at that verie time when I began to grow capable of those Secretes, and him selfe (hauing bene long debarred his owne inheritance & native Soile being restozed) ment thē immediately to returne to his wonted places of Exercise, there to haue deli-

nered me experimentally those the fruits of his long Trauels, and Practises. So sithence his death, hauing fostered by Study and conference those Theorical sparks Mathematicall from infancie by him impressed, after I grew to some Maturitie of yeares, and iudgement, sit to enter into trial and practise of these Conclusions, by continuall Law Brables, (being torments as repugnant to my Nature as the Internall Furies to Celestiall Muses) I haue for many yeares bene so vexed and turmoiled, & from those delectable Studies violently baled, that of all those rare Conclusions and Secrets I haue scarcely hitherto had any time of repose or quiet to wade effectually in any one, saue onely that of great Artillerie, wherein also there are yet many Mysteries that by farther pꝛoofes and trials Experimental, I must resoluē, befoze I can reduce that Art to such perfection as can content me. But so soone as by Gods aid I shall buttwine my selfe out of this miserable Labyrinth, wherein so long I haue bene snared, my first Endeouours shal be entirely to finish the Treatise of that new Science of maneging this new furious Engine and rare Inuention of great Artillerie, in such perfection as hitherto hath not bene in any language imparted with any Nation of Europe.

VIRESCIT VULNERE VIRTUS.





AN ADDITION TO *Stratoticos concerning great Ordinance.*



Albeit there are diuers Reasons that moue me not to Imprint my *Treatise of great Artillerie, Fireworks, &c.* Yet finding none sithēce the publishing of those my *Questions* of great Ordināce that will take on thē to answere any one, to giue particioñers some Encouragement to try Cōclusions, I haue at this Impression (by short marginall Notes) my selfe resolued the greater part and briefly opened diuers great *Secrets* of that *Science*, by my Father first found out, and neuer since his death to this houre by any els (stranger or other) discouered, or at least published in any *Language* to my knowledge, leauing the rest and many more (hetherto to the world vnknowne) to be fully accomplished in that *Treatise*: Wherein also by exact and most rare Instruments shalbe taught the perfect Arte to shoot at all Randōs frō one grade of altitude to 90 with all kind of peeces, with Rules infallible to find out their seuerall Rāges, & that not onely on leuell grounds *Equidistat* to the *Horizon*, but also vpō plaines, enclining or declining whatsoeuer the Angle of inclination be: But bycause I haue sene many *Treatises* of great Ordinance both in *Latin*, *Dutch*, *Italian* and *English*, wherein such as haue ta-

ken on them to intermeddle with this secret Arte of *Randons*, haue fouly and grossely erred: That our Nation be not myssed by such their ignorant and erroneous Rules, I will briefly set down such errors without mentioning the Authours names: That practizioners in great Artillerie may vse these notes as Sea markes to escape the Rockes: & yet the Authours names not further blemished nor called in question. For surely in some of their workes there are other mechanickall Rules and obseruatiōs that are very good and for the same deserue due Commendatiō, albeit entring into these matters of *Randons* (a matter so farre aboue their reach) either for want of Arte or experience sufficient, or both) they haue in those misteries of *Randons*, cōmitted many faults, and published many absurde errors.

Certaine erroneous Positions and
grounds published by Professors of this
Arte of great Artillerie.

The first Errour.

That in all peeces of Ordinance mounted aboue the utmost Randon, the Bullet is violently caried in a right line to his utmost distance from the earth, and then falleth Perpendicularly downe to the Horizon.

This error is so grosse and apparant to any meane practitioner, as a man would hardly thinke that any mā should be so simple as to write in any Art wherein he should haue so small Iudgement, or cōmit to the view of so woold so palpable errors. But the booke wherein ye shall finde this Position, is written by a Germane in Latin Intituled *De Artificio Esaculandi Sphaeras tormētarias*. Where he teacheth Geometrically to measure the distance of any place that with bombards ye would at Randon fire, and so

so giueth a multitude of Rules how to strike y^e place: But I will spend no time to refell those phantasies, for where the ground plot is erronious the rest is sutable, as appeareth by Orontius, who wrote a booke *De centum modis quadrantis Circulum*, all false and erronious.

The second Errour.

That all peeces of one Bullet being charged with one quantitie of the same Ponder, and discharged at one Randon shall make their Ranges proportionall to the lengthes of their peeces.

Albeit there are in deede these foure chief & most materiall causes of the diuersities of Ranges of the Bullets shot out of great Ordnance viz. The Powder, the Bullet, the Randon and the Length of the Peece, and where in all points the three first agree and are nothing different, it seemeth in reason probable, that the diuersitie of the length of the peeces beyng the onely cause of the difference of their Ranges, should cause the one to be proportionall to the other: yet in truth by Experience ye shall finde it nothing so: and Experience prouing the contrary I haue endeouored to seeke the naturall cause and reason thereof, which I could neuer better conceaue then by the composition of simples which are hote or cold in severall degrees: whose complexion followeth not the bare proportion of the quantitie or qualitie of the Components, but a proportion mixt: wherein it were now to long to enter, for that this matter alone would require a large Treatise: but the errour by any small experience any man may finde, and whosoever holdeth this erronious ground for truth, all that he buildeth thereon will proue accordingly.

The

The third Errour.

That if you charge any one peece with severall quantitie of one kinde of powder, the peece being discharged two severall tymes at one Randon and with the same bullet, shall make different Ranges proportionall to the waight or quantities of the powder.

This Position is maintained by an Italian that taketh vpon him to be a great Master in this Art, & vpon this Position he teacheth Arithmetically by the Rule of Proportion to finde out the different grazes of the bullets, but as *Palingenius* saith.

*Friula si fuerint fundamina, tempore paruo
Deficiet quicquid super his fabricare volumus.*

And so his Rules being all as friuolous as his Positions, I hold it but lost labour to make repetition of them, or otherwise to spend wordes about them, but onely to admonish the ingenious practitioner that affecteth perfection in this Science, not to lose his time in reading any of those bookes or discourses that are founded on these false principles and grounds erroneous.

The fourth Errour.

The fourth and chief of all the rest is, in the grade of utmost Randon for most writers that ever I read agree in this, that the mount of 45 grades above the Horizontall playne should make there the utmost range.

This Errour, as I take it, they are induced rather by a superficiall consideration and Coniecture, then by any sound triall or demonstration: for seeing that by mounting

firing of their peeces. 1. 2. 3. 10. 20. 30. 40. grades a-
 boue the Horizon they finde the Bullet rangeth still fur-
 ther and further of, and afterward at 50 grades falleth
 short, and at 60 and 70 shorter, and so the moze grades
 of mount the lesser range till being mounted 90 grades
 the Bullet maketh no Range at all, but falleth downe
 vpon the peece againe. Hereof they conclude that the 45 grade
 being the true meane betwene the Horizontall and Ver-
 ticall line, must needs therefore be the true grade of vt-
 most Randon. Euen as the Sunne mounting from the
 Equinoctiall line, the day and night being then equall,
 the day doth still encrease till it come to a Solstitium, and
 then beginneth the day to shorten, and so continueth it
 shortning lesse and lesse till it returne to his Equinocti-
 all line agayne, in Libra where the day and night is a-
 gaine equall: Wherefore thinke they that as this Tro-
 pike or vtmost Randon of the Sunne is exactly in the
 meane and middle grade, betwene the Equinoctiall, so
 should this Tropike or vtmost Randon of the Bullet be
 likewise the meane betwene the Horizontall & verticall
 mount: wherein one part of their Argumēt is in deede most
 true. That this Tropike or grade of vtmost Randon is cer-
 tainly a iust *Mediū* betwene his two extremes: but those
 extremes are by the ill defined: For making the Horizon-
 tall or Leuell range the one, they will haue the verticall or
 mount of 90 grades to be the other, not considering that
 these are different in their Ranges, the one making no
 range at all, but falling directly on the peece, where the o-
 ther Horizontal range is as farre from the peece as the surie
 of the powder can carie the bullet in his right line. But if
 they would first by true Experience finde out what grade
 of Randon would reach and not out shote the true leuell
 or Horizontall range, or by discharging first their peece at
 one grade of Randon from the Horizon, and noting his
 range or grade, would then from the Zenith downward

This secret
of great im-
portance was
first discou-
ered by my
Father.

at severall degrees make p^{ro}ofe what grade it is that reach that former range of one degree (the which perhaps they shall finde not much more then 10 degrees frō the Zenith:) then shall the middle betwēne these two mountes be in dēde the true *Medium*, Tropike, or vtmost Range: the which they shall finde more then one, 2. 3. or 4. degrees lesse then 45. Which grade by all men generally held, and as it were by oracle set downe to be the grade of vtmost Range, Experience the mistresse of all Artes sensible and mechanickall, will playnly disprove: and no lesse playnly approue this other *Medium* by me now taught, to be the true grade of greatest Range, I meane in a playne Horizontall.

The first Errour.

That every degree of Randon doth equally encrease the Range in any one peece, from the Zenith to 45 their Tropike grade, and so in decreasing likewise, and that proportionally in all peeces more or lesse according to their force.

For Example, their meaning is, that if their peece at one degree of Randon frō the Zenith deliuer the Bullet 4 pace distant frō the peece, then shall the same peece at 2 degrees of declining Randō shote 8 pace, at 3 grades 12 pace, at 4 grades 16. pace, at 5 grades 20, pace, & so 4 pace more then other at every grade till ye come to 45 grades, which by that their Rule must be 160 pace, and proportionally in all other peeces according to their different forces. The which Rule surely if it were true, were worthy to be written in letters of gold, being of such facilitie as every man might then full easily become a perfect master in that Art.

And in dēde for the Range of 45 grades compared with Point Blanck, that Autho^r hits not very much awry, and therefore it appeares he was not altogether voyde of all Experience. But for the meane Randons from 45 vpward,
his

his Rule is as true, as if he would reason thus: from the entring of the Sunne into the Equator, the day being the but 12 houres long, vnto his entring into the Tropike is 3. monethes, and the day being then 16 houres and an halfe long, is in those 3. monethes encreased $4\frac{1}{2}$ houres: therefore in the first moneth it is encreased one houre and an halfe, and as much in the second, and likewise in the third: Whereas by due triall it is in deede found that in the first moneth the day encreaseth about 2. houres, and in the last moneth not $\frac{2}{3}$ of one houre: As if a man should say, that one degree of the signe Cancer, did encrease the day as much as one of Aries, whereas one degree of Aries doth moze encrease the day the some 6. in Cancer. And even in like manner by true Experience we shall find y^e one degree of Randon beginning fro the Zenith, shall moze alter the Range of the bullet in the Horizontall playne, the 3 grades about their *Mediu* of 45. And likewise one or 2 grades about the Horizontall mount shall moze encrease the bullets Range then 8. or 10 grades after ye are past 30 degrees of Randon: So that such plaine dunsical Rules in matters of so great Art and curious skil are mere ridiculous, & bewray ouer much the simplicitie of the Autho^rs to shote at marks so far beyond their leuell. For as it is utterly impossible exactly to cast the Iournall alteration^s of the Sunnes Period, (otherwise then by curious Calculati^ons by tables of *Sinus*, or by Instrum^{en}ts or tables framed by such Calculati^ons. So is it far moze difficile exactly to supputate the intricate irregular courses of the Bullet receauing his alterations from the manifold diuersitie of proportions of Powder bullet Cylinder and Randon, as in my questions of Artillerie is partly opened.

The Theorike of these circuits of Bullets mixt of violent and naturall motions being farre moze intricate and diffuse, and such as require many mo and moze strange varietie of concentricke Epicycles and Excetricke Circles or

rather Arkes Helicall, then either that of the Sunne, or any other Planet. But it fareth in this, as in the Art Militare. A private Souldier sometimes, when his head will reach no more but how to stand in Sentinell or march to his garde doth take him selfe to be a perfect Souldier, but if his wit be capable of greater matters as to become a Corporall of the field or Sergeant Maior, then beginneth he to learne his ignoraunce; and the skilfuller hee groweth in his profession, the more he seeth and discovereth his wantes. And the common Mariner whose head will reach no more but onelie how to handle his tard ropes, to firlie his sailes and clime the top, doth lesse know his owne ignorance in the arte of Nauigation, then such a maister of a shippe or Pilote as hath by his Chartes and art sailed the worlde round. These curious pointes of arte are the praise of Eagles, and not of Daves, and the more a man knowes, the more he still learnes his owne wants. But these errors are such, as whosoever belaueth or groundeth himselfe on anie of them, it is utterly impossible he should be able to conclude any certaintie concerning Randons, wherein only consisteth the chiefe difficulties and rarest mysteries of this new Science or Arte of great Artillerie.





Another Addition concerning Inuasion

long since by the Author exhibited in
writing to the Patrone of this *Stratagickos*, and not vnfit to be
now annexed to the
Treatise it selfe.

*A briefe Discourse what orders were best for repulſing
of forraine force, if at any time they ſhould invade
vs by ſea in Kent, or elſewhere.*

TH E acustomed order hath bene by firing
Beacons to put the Shire in Armes, and pre-
ſently all forces to repaire to the landing
place, there without delay to giue them bat-
taile. But becauſe there are other opinions I
thinke it firſt conuenient to ſet downe the reaſons of ech
opinion, and then a reſolution what I find beſt.

Such as maintaine this old accuſtomed order, alledge be-
ſides the good ſucceſſe that many times it hath taken, that
in reaſon alſo it is beſt dealing with the Enimie at the lan-
ding before he hath firme footing, and before he ſhal haue
leaſure to range his men in due order of battaile, & before
he ſhalbe able to land his Ordinance, Horſe, and Carriages.
And that a verie few men thus in time ſhalbe able to giue
greater annoyance, and do greater ſeruice vpon the Enimie
than ten times ſo many, when the Enimie is landed, and
ſetled in ſtrength of order with all his Horſe, Ordinance
and Carriages. They alſo adde theſe reaſons enſuing for
Confirmation of their Cuſtome.

The Reasons.

First the furie of the Countrey vpon the first fying of the Beacons is great, euerie man *Pro Aris & focus* violently running downe to the sea side to repell the disordered Enimie at the first confused landing: which furie if we suffer to grow cold, we shall not so easily enflame againe.

Secondly euerie man knoweth how great aduantage they haue that haue firme footing on land to encounter an Enimie that must land out of boates in confused stragling manner: and therefore more willingly and speedily wil go to enioy the benefite of this aduantage, whereas if you suffer the Enimie to land and put himsele in *Militare* order, he becommeth more terrible vnto vs.

Also while the Enimie is landing, if he finde any difficultie or danger being in boates they are readie to retyre to their ships againe: But if they be once landed with their Artillerie, Horse, Carriages &c. It is not then possible for them to retyre to their shippes againe without extream daunger of their liues vpon the retreite, and the dishonorable losse of all their Munition &c. And therefore necessitie enforcing them to fight, and all hope of escape by flight being then taken away from them, they become ten times more daungerous Enimies to deale withall than before.

Farther there is in this Realme (as in all States diuided in religion) no small numbers of traitorous minds, who hauing time to conferre, and seeing an Enimie of force alredy landed, may and will then discouer their malice, which on a sodaine they dare not nor cannot.

Another opinion.

Some other hold this old custome of running to the sea-side to be a barbarous Custome, void of order, and warlike Discipline, verie perillous to our selues, not hurtfull
to

to the Enimie, but rather a meane to loose all. And therefore with by especiall commandement that order of repaire to the seafide be restrained, and the Enimie suffered to land quietly, and in the meane time to driue and carrie away all Cattle, victuall, forrage, carriage &c. and certaine Places of Assemblie appointed a good distance of the sea from whence they may march in warlike order, and so by driuing and carrying away all victuals and fortifying of all streights, and passages to wearie the Enimie with time. And these be the reasons for maintenance of this second opinion.

The Reasons of this second opinion.

First it is said, the inuading Enemy bringeth a select companie of disciplined and well trained souldiers, whom we seeke to encounter with a confused multitude of men vntrained, In which match there is no comparison, but losse certaine.

Againe it is said, An Enimie of force meaning to land, will do it in despite of vs, and then the Countrey offering to repell him, and finding themselues not able, grow much more fearefull then if quietly without resistance we had suffred the Enimie to land.

Againe while we suffer the Enemy to land, we may driue away all Cattle, and prouision farther into the Countrey, and then maintaine straights and passages wel fenced and fortified, so as the Enimie shal be forced to approach vs vpon our owne strengthes and Fortifications, to his great perill and daunger.

Againe they say, if in this manner wee keepe victuals from the by land, and her Maiesties Nauy also in the meane time keeping the seas, the Enimie for want of victuals only shalbe forced to retire, and glad to withdraw himselfe.

Farther it is alledged how doubtfull a thing Battaille is, and how daungerous for a King to commit his

Crowne vpon it, and therefore that temporizing course extolled.

These I think be the reasons most effectual to impugne the speedie repaire to the sea side, and to maintaine the other opinion for suffering the Enimie to land quietly, & by driuing and Carrying away victuals, and forrage, and fortifying of straights & passages, by *Time* and *Famine* to wearie the Enimie.

But hauing attentiuely wayed the reasons on both sides, and by experience of former inuasions examining the successe and sequele of like attempts, as I am farre off from allowing of any Confused disorderly running to the sea side to encounter a select trained well Disciplined enimie inuading: so am I also vtterly against that second opinion, viz. to suffer the Enimie quietly to land all his forces, munition &c. Not doubting but a meane course farre more seruiceable than either of them both may be taken. Wherby the benefite of that old Custome may be imbraced, and the disorders of the other well noted may be reformed, and no aduantage to annoy the inuading Enimie omitted; as by these reasons ensuing better may be iudged.

The Reasons.

First I say, one of the chieft forces of this famous Island of *England*, consisteth in this, That it is fortified naturally with such a Trench or Ditch as the sea is: whereby it is not so subiect to inuasion as other Countries lying on the Maine, Which singular benefite, and peculiar aduantage of this our Countrey is vtterly lost, if we suffer the Enimie quietly to lande all his forces Munition, &c. and to take firme footing quietly on the maine.

Againe, whereas this noble Island hath such a number of Marriners and good shipping both of her Maiesties royall

royal Naue, and also of merchants, as may hope with good successe to encounter on sea the force of any forraine Enimie, we loose a great part of the benefite of this our chiefe strength, if relying on this second opinion we should suffer the Enimie quietly to land, and then temporize afterward.

Againe there is no man of any meane experience but knoweth with what daunger men land out of boates if there be but any meane force before landing to resist them. For if therwhile any storme arise, the sea alone fighteth for vs, and with any small resistance on land, will drowne great numbers of our inuading Enemies.

Also any small Trench on land shall lodge shot in safetie to spoile as many of our Enimies as in boates shall offer to land, before they can approch the shore.

Also in landing, before they can haue time to put themselves in order, what an execution may a far lesse number of billes or swords and targets do on them before they shall haue time to vnite their forces.

Againe after the remnant shall land, if they be not all drowned, slaine, or repelled in or before their landing, how easie a matter shall it be for a few Lances ioyned with the weapons aforesaid, to put such a confused, dispersed, scattered, seabeaten Companie to the sword, before they shall euer be able to aduance standard, or put themselves in order of battaile.

Besides all this, if her Maiesties forces by sea should not in time be assembled of such strength as to be able before landing to giue them battaile, yet any meane force assailing their shippes while their men are in landing cannot but greatly annoy them; if not vtterly defeat them.

Also in most places, except the Enimie bring his tide iustly with him he cannot land, and then if part land, & any

meane resistance made, to giue impediment to the rest till the tyde passe, their diuided forces may more easily be defeated.

Againe, it is no small time that is requisite to land an Armie with horse, Carriages, Ordinance, Munition, and Victuals, without which an *Inuador* shall neuer be able to preuaile. And then if any meane resistance be made at the landing, it much prolongeth the same time. So as any storme happening, the Winds, Tides, Shelues, Rockes, Bars and Seas fighteth for vs, wholly in our fauour, and to the ruine of our Enimie. And therefore I vtterly disallow that opinion to giue the Enimie leaue quietly to land, and then by deuise to temporise afterward. Farther if such a resolution should by the Prince and State be taken that the inuading Enimie should be suffered to land quietly, to spoile and burne at their pleasure, and the inward forces of the Countrey not permitted, euen at the first landing to come to their rescue, it would cause no doubt all the inhabitants of the Coast to abandon their Townes, and leaue the frontiers desolate, which the wise Kings and graue Councillors of this land haue euer sought to make populous by granting many *Privileges* and *Immunities*, to allure Inhabitants on the Frontiers.

But touching driuing or carying away of victuals, and leauing the Countrey waste, thereby to famish our landed Enimie, it is a thing more easily wished than performed. I confesse in *Ireland*, where most of their substance consisteth of Kyne, it is easily done, but in this rich and wealthy Countrey of *England*, it is not possible but that the Enimie if he be once landed with all his forces shall finde houses full of prouision, and barnes full of all kinde of forrage and corne all the Countrey ouer, vnlesse our Prince should commaund all to be wasted with fire, which *Precedent* we see seldome or neuer put in vre, neither in these late warres of *France* and *Flanders*, nor in any former inuasions

uations that we read of. For it would make the Prince odious, and alienate extremely the subjects minds, & therefore not to be vsed but vpon great extremities, when all other meanes faile.

And here in England about all other Countries it may worst be done, for our Townes are poore, weake, vnprovided, and vnfortified, the Countrey full of habitation, populous, rich, and abundant of all commodities. In the Low Countries by reason of the great store of their strong well fortified Townes, they might much more easily driue and carrie to their Cities at hand all victuall and forrage &c. And yet when the last great Armies of the *States* and *Don Iohn* were in the field, notwithstanding all the Boores and countrey people were fledde and retired to the next walled Townes, and had knowledge long before of the approaching of the Armies, yet were they not able so to driue and carrie away the Victuals and forrage, but that the Enemy found barnes full in euerie place, in such sort as we neuer were forced at any time to forrage foure myles from our Campe. So difficult or rather impossible a thing it is to carrie away Victuals and forrage, or to leaue the enemy a waste Countrey. But if here in England wee should driue or carrie away our victuals or forrage to the next walled Townes, the Enemy being quietly landed with his Munition, should haue his chiefe desire, knowing not onely howe weake and vnfortified our Townes are, but also how vnprovided for all necessities to abide a siege, if Fortification on sodaine could be made. Wherefore I could wish all prouident meanes vsed to giue the Enemy all possible annoyance before and at the landing, and by no meanes to suffer him to land quietly, or to trust to that temporizing course, which is rather to be practised when all other meanes faile, than to be relied vpon at the beginning.

I graunt it perillous for a defendant Prince to hazard his Crowne on a battaile, and more daungerous for men vntrained to encounter expert disciplined Souldiers, and most perillous to vs that haue no strong Townes to make heade if wee loose a battaile. And therefore it is no part of my meaning to wish our Prince to giue any inuading Enimie battaile with all our forces, how well prepared and ordered soeuer we should be. But my meaning is to haue such prouision in euerie shire as we may be able readily on any sodaine to giue the Enimie all annoyance possible, before and at the landing, while the inward forces of our Countrey may the better assemble and put themselues in Militare order, to proceed after as shalbe found most conuenient.

And therefore, to auoid as well confused assemblies of our owne forces, as also to be able like Souldiers orderly to annoy the Enimie by all meanes at the landing, and neuerthelesse to reserue all aduantages of temporizing afterward if we should not defeate or repell them at or before the landing, these notes ensuing I would wish to be considered.

Notes to be remembered in the Musters, and ordering of men hereafter.

First that all bad Armour, weapons, and furniture be defaced, or taken away, and such new provided as may be seruiceable. And this to be better executed without fauour indifferently on all degrees.

That better Consideration be had of selecting or enrolling of souldiers, that onely actiue and able bodies be appointed for weapon, and the rest for pyoners or laborers. And that such laborers be enioyned also to haue in redines their

The most substantial & honest men to be enrolled, if their bodies be fit for it.

their spade, shouell, or pickaxe with them accordingly as at the musters shall be appointed. These well directed shall do seruice with the best in the field. I would not haue them denied, but rather allowed euery man also his light-Pike or Black-bill to execute when time shall serue.

That good regard be had to maintaine still full numbers of armed Pikes. For as we grow by wealth more delicate we shall seeke generally with the *Italian & French* to leaue that weapon, and thereby greatly weaken the forces of our land.

That some games be erected in seuerall places in euery shire of England, to allure men to shoote in Muskets &c. and to bestow their Bullets surely. For the vsuall maner of trayning by wasting powder, is ridiculous, and no seruice in the world in it.

But especially that prouision be made of one kinde of weapon and seruiture, that in all our former musters hath bene omitted, and in mine opinion ought specially aboue all others to be prouided in all shires fronting on the Sea, where inuasion may be made, I meane the *Argoletier*.

These *Argoletiers* neede no such chief horse of force as the Launce or man at Armes, but euery meane gelding, and ordinary hackney will serue this purpose, whereby it shall be more easie to haue in readinesse a thousand of these *Argoletiers*, than an hundred sufficiēt *Launces*: and yet would I haue the most part of their horses such as were able for foure or fve miles, when neede shall be, to take vp and carry a foote shot or Musketier behinde, and so shall they be able for repelling of sodaine inuasions to do singular seruice being well directed, and farre aboue any other heretofore in our musters prouided.

The *Pioners* or labourers also being great numbers will alwayes readily be at hād to cast *Trenches* or make Sconces to lodge shot in safetie to annoy, and fortifie straightes and passages: and finally when time is, on the scattering or fly-

Pp iij

Armed Pikes

The Corporals to make their benefites of the prizes.

Iustices of Peace, and Lawyers according to their degree to keepe one or mo in readinesse. *Argoletiers*.

Musketiers mounted.

Pioners.

Places of
Assembly.

ing Enemy to do execution also.

It shall not be difficult in euery Shire to finde some such two or three places of assembly within a few miles of the coast, as may discouer the Enemy on the Sea farre of, and plainly perceiue on what part he meaneth to land, from whence supplies accordingly may be sent.

Repaire to
the coast.

And first I would wish of those *Argolitiers*, and shot on foote some conuenient Companies sent to the coast and order geuen that all the labourers of those parts should attend on the to make trenches or Sconces to stay the Enemy, as they should be directed, in which time the armed Pikes accompanied with Launces may haue space to range them selues in order Militare, without confusion or disorder to march towardes the Enemy and if these *Argolitiers*, and other shot should happen by the enemy to be repelled, yet by the aide of the labourers of the countrey they may retire in such sort frō one strength to an other, as the Enemy with great losse shall very slowly follow them.

Difference
of opinion
daungerous.

And for asmuch as *Kent* is the most likely Shire of all other for many respects to be attempted, whensoever any *Inuasion* shalbe by Sea, it were requisite before hand by men of skill to haue the landing places well surueyed, and conuenient places of assembly appointed, and all passages or straights well considered, that good direction may be geuen where to assemble, and how to proceede vpon any sodaine, when occasion shall require: for at this present not onely among the common sort of ignoraunt Captaines but euen among some of good Iudgement and experience, if such an occasion should sodainely happen, there would be founde such repugnance of opinions, as perhappes the worst and most perillous resolution might be taken. In other Artes errors are not so daungerous but vpon better deliberation they may be corrected; but in these Militare Causes especially in matter of *Inuasion* an erroneous resolution at the first may vtterly overthrow the state for euer.

Resolution
after mature
deliberation
most neces-
sarie.

uer. I would wishe this matter of so great importance effectually considered, before imminent daunger while tyme is. And so is there no doubt (the naturall Fortification of this Island considered) with the great store of shipping and Mariners, and the aboundance of Armour and weapon now in England and able bodyes also to vse them if they were duely trayned and exercised, but we may with good order repell the furie of all forraine Enemies whatsoeuer.

*Certaine Engines and Inuentions not vsuall
to be thought on and had
in readinesse.*

Light mortar peeces longer then the vsuall to be easily caried by mē onely, to shoote out balles of artificial fire, to burne, and others to breake into many peeces, making great slaughter where they fall.

Small carriages to lay many Muskets on, & to be managed with men, such as the famous Inginier *Pietro Nanarra* first practised in *Italy*, may with some *Additions* vpo many occasiōs, do great seruice, especially the Muskets being charged with arrowes and mounted to conuenient Randons to beate at all distances within a myle compasse on euery side with greater violence then the best Archer in all England is able to do at fise score.

Likewise certaine Peeces and other Engins to shoote out an whole sheafe of arrowes at once, which may beate to the ground a whole Troupe of horse half a myle and more distant, when they shall take themselues to be vtterly out of all danger.

Certaine double Barrels & artificiall Tunnes cased with stones and other kinde of murdering shot, are singular for defence of Sconces or Castles: For one of these artificiall Tunnes may destroy 2. or 3. hundred men at once.

Certaine artificiall portable vessells also, to blow open any gate on the sodaine, are fit to be had in a readinesse, if the inuading Enemie should surprise any Castle or place of strength.

Of these and many mo important matters Militare I shall haue occasion at large to dilate in my *Treatise* of great Artillerie and Pyrotechine, whose Publication I haue for diuers due respectes hitherto differred.

PRIVISQVAM INCEPERIS CONSVLTO
AT VBI CONSVLERIS
MATVRE FACTO
OPVS EST.







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